SKEPTICAL INQUIRER

Vol. 18, No. 2 Winter 1994 / $6.25

Paul Kurtz

THE NEW SKEPTICISM

William Grey

THE PROBLEM OF 'PSI'

plus

Dungeons & Dragons Defended • EMF Cancer Scares
Global Prophecy • Norman Vincent Pealeism

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Published by the Committee for the Scientific Investigation of Claims of the Paranormal

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Subscriptions, change of address, and advertising should be addressed to: THE SKEPTICAL INQUIRER, Box 703, Buffalo, NY 14226-0703. Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice. Subscribers to THE SKEPTICAL INQUIRER may not speak on behalf of CSICOP or THE SKEPTICAL INQUIRER.

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Articles, reports, reviews, and letters published in THE SKEPTICAL INQUIRER represent the views and work of individual authors. Their publication does not necessarily constitute an endorsement by CSICOP or its members unless so stated.

THE SKEPTICAL INQUIRER is indexed in the *Readers' Guide to Periodical Literature.*

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Subscription Rates: Individuals, libraries, and institutions, $25.00 a year; back issues, $6.25 each.

THE SKEPTICAL INQUIRER (ISSN 0194-6730) is published quarterly, Winter, Spring, Summer, and Fall. Printed in Canada. Second-class postage paid at Buffalo, New York, and additional mailing offices. Send changes of address to THE SKEPTICAL INQUIRER, Box 703, Buffalo, NY 14226-0703.

SKEPTICAL INQUIRER

Vol. 18, No. 2, Winter 1994

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The Committee for the Scientific Investigation
of Claims of the Paranormal
announces the

1994 CSICOP Conference
"The Psychology of Belief"

at the
Doubletree Suites Hotel
Seattle
Friday, Saturday, and Sunday
June 24, 25, and 26

Keynote Address
(Friday at 8:00 P.M.)

Carl Sagan

Friday, June 24

8:00 A.M. - 9:00 A.M.: Registration

9:00 A.M. - 12:00 NOON: THE BELIEF ENGINE:
HOW WORLDVIEWS ARE FORMED
James Alcock, professor of psychology, Glendon College, York University, Toronto
Ray Hyman, professor of psychology, University of Oregon, Eugene
Anthony Pratkanis, professor of psychology, University of California, Santa Cruz
Other speakers to be announced.

12:45 P.M. - 2:15 P.M.: Luncheon (optional): AN ILLUSTRATED HISTORY OF UFOs
James McGaha and Philip J. Klass

2:30 P.M. - 5:30 P.M.: HOW WE FOOL OURSELVES:
ANOMALIES OF PERCEPTION AND INTERPRETATION
Barry Beyerstein, professor of psychology, Simon Fraser University, Vancouver, B.C.
Elizabeth Loftus, professor of psychology, University of Washington, Seattle
Other speakers to be announced.

5:00 P.M. - 8:00 P.M.: Dinner Break

8:00 P.M.: KEYNOTE ADDRESS
Carl Sagan, professor of astronomy and space sciences, Cornell University

Saturday, June 25

9:00 A.M. - 12:00 NOON: MEMORY: HOW RELIABLE IS IT?
Stephen Ceci, professor of psychology, Cornell University
Richard Ofshe, professor of sociology, University of California, Berkeley
Philip J. Klass, former senior editor, *Aviation Week & Space Technology*
Robert Baker, professor emeritus of psychology, University of Kentucky

12:00 NOON - 2:00 P.M.: CSICOP Luncheon (optional)
Program to be announced.

2:00 P.M. - 5:00 P.M.: Two Concurrent Sessions, A and B

Session A

I. CONSPIRACY THEORIES
Don Kates, attorney and criminologist, San Francisco
Valerie Klein, conspiracy theory expert

II. NEAR-DEATH EXPERIENCES
Susan Blackmore, senior lecturer in psychology, University of the West of England

Other speakers to be announced.

Session B: INFLUENCING BELIEFS IN THE COURTROOM: RULES OF LAW, EXPERT TESTIMONY, AND SCIENCE
Peter Huber, author of *Galileo's Revenge: Junk Science in the Courtroom*

Timothy Moore, associate professor of psychology, Glendon College, York University, Toronto: "Scientific Consensus and Expert Testimony: Lessons from the Judas Priest Trial"

Gerald M. Rosen, clinical associate professor, Departments of Psychiatry and Psychology, University of Washington, Seattle: "Confirmatory Bias in Forensic Settings"

Barry Beyerstein, Brain Behavior Laboratory, Psychology Department, Simon Fraser University, Vancouver, B.C.: "Graphology: Pseudoscientists in the Courtroom"

6:00 P.M. - 7:00 P.M.: Pre-Banquet Social Hour (cash bar)

7:00 P.M. - 10:00 P.M.: AWARDS BANQUET (optional)
Awards Presentation: Paul Kurtz, CSICOP Chairman

Sunday, June 26

9:00 A.M. - 12:00 NOON: Open Meeting with CSICOP Executive Council

(Continued on next page.)

REGISTRATION FORM

Preregistration is advised. Registration fees do not include meals or accommodations. (Full-time students with I.D., $25.00.) Make checks payable and return to:

1994 CSICOP Conference, P.O. Box 703, Buffalo, New York 14226

☐ YES, I (we) plan to attend the 1994 CSICOP Conference.

☐ $135 Registration for ____ person(s), including Keynote Address. $____

☐ $20 Friday CSICOP Luncheon (optional) for ____ person(s). $____

☐ $20 Saturday Luncheon (optional) for ____ person(s). $____

☐ $30 Saturday Awards Banquet (optional) for ____ person(s). $____

☐ $15 Keynote Address (this fee is for nonregistrants only) for ____ person(s). $____

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☐ No, I will not be able to attend the conference, but please accept my contribution (tax-deductible) of $____ to help cover the costs of this and future CSICOP special events.

ACCOMMODATIONS: Doubletree Suites Hotel (206-575-8220) Single/double $79 (includes complimentary full breakfast buffet). Mention CSICOP Conference for this special rate. Cut-off date for conference rate is June 8. All suites have livingroom, bedroom, and bath; two telephones, two televisions, refrigerator, and wetbar.

Or stay at the Doubletree Inn (206-575-8220) directly across the street: Single/double $65.

Complimentary shuttle service to and from Sea-Tac Airport to Doubletree Suites or Doubletree Inn; 15 minutes from downtown.

Transportation: For special discount airline rates, call CSICOP's travel agent, Judy Pensack, Creative Destinations, 800-572-5440 or FAX 407-830-5530.

For more information, call or write Mary Rose Hays, CSICOP, P.O. Box 703, Buffalo, New York 14226. 716-636-1425, FAX 716-636-1733.

Media representatives should contact Barry Karr at 716-636-1425.

News and Comment

The Sorry Saga of CBS and Ark Pseudoscience: Network Drops Two Sun Programs, Keeps One

The CBS television network has scrapped two projects in development with Sun International Pictures, the company that produced "The Incredible Discovery of Noah's Ark," a pro-creationist pseudodocumentary based on a hoax, shown on CBS on February 20.

The decision came when *Los Angeles Times* reporter Daniel Cerone presented CBS with the confession of George Jammal, an Israeli actor living in California, who played a key role in the documentary. Jammal admitted to the *Times* in an interview during the last week of October that he made up the story of discovering the piece of wood from Noah's Ark. He did so to expose the production company's shoddy research methods on behalf of what he considered to be religious propaganda.

The *Times* reported the confession October 30 ("Admitting Noah's Ark Hoax," p. B4) and said that as a result CBS decided the day before to close down production of "Revelations" and "The UFO Phenomenon," the two in-progress features by Sun, a Salt Lake City production company. "All of this has clearly made us re-examine our business relationship with Sun, and we won't be going forward with those programs," CBS spokesperson Susan Tick said.

But CBS said it intended to go ahead with plans to broadcast a nearly completed program from Sun called "Mysteries of the Ancient World," which deals with such phenomena as the Sphinx, Nostradamus, the Bermuda Triangle, and the Shroud of Turin. It claimed this program had been carefully checked for accuracy and reviewed by the network's legal and program practices department.

The network also said it does not plan to run an on-air correction concerning "Incredible Discovery."

The basic facts of the hoax had been published four months earlier, in the July 5 *Time* magazine, the Summer 1993 *Free Inquiry* (see *SI* Articles of Note, Fall 1993, Jaroff and Fox listings), and elsewhere. But Jammal originally held to his story, as did Sun. A friend of his who was in on the hoax, Gerald Larue, professor emeritus of biblical history and archaeology at the University of Southern California, had alerted the media.

Jammal now says the hoax was painfully obvious. The wood he had said was from the Ark was actually a piece of California pine from some railroad tracks in Long Beach. He had hardened it by frying it on his kitchen stove, and even made a videotape of himself doing that. He has never been to Turkey. The producers never made any effort to check his story, nor to subject the wood to carbon dating, despite offers to have that done. "This is a scam that has been pulled on the

American public, and it's gone too far," Jammal said of the program. "They're foisting religious propaganda on Americans and making them believe it's true. So I hoaxed the hoaxers."

"This was a dishonest program," Larue said.

"We were obviously duped, and all I can do is admit to that," said Sun President Allan Pedersen.

What made Jammal finally come forward? "When I heard that CBS was going forward with more phony, religious, documentary, pseudo-science programs, that's when my volcano erupted," Jammal told the *Times*.

"Professor Larue and many other scholars wrote letters of protest and nobody listened," he said. "Well, now they're listening and they're talking. I feel I made a difference."

A November 1 *Los Angeles Times* column by Howard Rosenberg titled "Will CBS See Error of Its Ways?" said CBS's credibility was falling like a brick. It condemned CBS for airing the original program, stonewalling for four months, and now, once the hoax is admitted, saying it planned no on-air correction and would go ahead with Sun's "Mysteries of the Ancient World." Wrote Rosenberg: "Not to worry, though, says spokeswoman Tick, because CBS has checked it for accuracy. So listen up, you would-be hoaxers, you're not dealing with Beavis and Butt-head here."

—*Kendrick Frazier*

Supreme Court Rejects 'Anything Goes' Approach To Expert Scientific Testimony

The U.S. Supreme Court recently decided *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, the "junk science" case that has agitated and divided the scientific community. Although the decision went against Merrell Dow and allowed in scientific evidence rejected by the lower courts, the decision is by no means a defeat for good science in the courtroom.

Daubert involved claims by two minors that they were born with serious birth defects because their mother had taken Bendectin, a morning-sickness drug made by Merrell Dow. Merrell Dow asked the trial court for a summary judgment, claiming there was no evidence that Bendectin caused birth defects and that the Dauberts could not come up with any good evidence that it did. Merrell Dow's expert testified that none of the published studies of Bendectin—more than 30, involving more than 130,000 patients—found the drug capable of causing birth defects.

The Dauberts presented experts who based their conclusions on *in vitro* and *in vivo* animal studies supposedly showing a link between Bendectin and birth defects. They also offered a statistical reanalysis of the epidemiological studies, which attempted to show that a very weak causal link might have been obscured by the standard methods used in the earlier studies.

The trial court applied the rule in *Frye v. U.S.* that scientific evidence should be admitted only if the principle

on which it is based is sufficiently established to be generally accepted in the relevant field. The trial court and the Court of Appeals thought the Dauberts' evidence did not meet this test because it was never peer-reviewed or published.

The Dauberts appealed, claiming that Congress repealed the *Frye* general-acceptance rule when it enacted the Federal Rules of Evidence in 1975. The Dauberts argued that under Rule 702, any witness ". . . qualified as an expert by knowledge, skill, experience and training or education . . ." could give his or her opinion on a scientific issue, without any requirement as to whether the witness's theory or practice was generally accepted by other scientists or had been published in professional journals. This free-wheeling interpretation of the Federal Rules troubled many scientists and judges who felt it would allow any charlatan or crackpot with a diploma to pitch his case to the jury. Indeed, in some state and federal courts that have not followed *Frye*, exactly that has happened. Some of the ugly examples are collected in Peter Huber's recent book, *Galileo's Revenge: Junk Science in the Courtroom.*

The Supreme Court, in an opinion by Justice Blackmun, held the Federal Rules of Evidence indeed replaced *Frye v. U.S.* and that the "general acceptance" test was no longer the sole standard for the admissibility of scientific evidence. It sent the case back to the district court for trial on the merits under the new standards. Although the Federal Rules of Evidence only apply in federal courts, many state courts have recently codified their evidence law in practically identical language; therefore, the decision will have an impact beyond the federal circuits.

The decision was not, however, necessarily a defeat for those who believe court judgments should be aligned with the scientific consensus. The Supreme Court rejected an "anything goes" approach to expert scientific testimony. Rule 104 requires the trial judge to determine at the outset whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to ". . . understand or determine a fact in issue." The Court wrote: "This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." Justice Blackmun set out some "general observations" to assist trial judges in determining what is reliable scientific knowledge.

- Is the theory behind the proposed testimony testable? In some cases, judges will have to find out if they are dealing with a potentially falsifiable theory or not. (Questions of theoretical falsifiability don't seem to be helpful in the courtroom context. Perhaps the Court has in mind theories that are practically unfalsifiable, because their proponents have a long record of dodging or explaining away contradictory evidence. Knowing that a theory can be and has been tested makes it more reliable.)
- Has the theory been subjected to peer review and publication? Submission to the scrutiny of the scientific community is a component of good science, in part because it makes it more likely that errors will be detected.
- In the case of particular techniques, do we know the actual or potential rate of error? (Here the Court mentions the example

of the now-discredited "science" of spectographic voice identification.) That is, even if the theory is sound in principle, can it be applied reliably in practice?

- Finally, has the theory or technique become generally accepted? General acceptance will not be the only criterion for reliability, but it can be an important factor.

The Court spoke to the concerns of some groups, including some prominent scientists, who filed friend-of-the-court briefs arguing that to allow judges to screen scientific evidence would impose scientific orthodoxy and stifle the search for truth. These concerns seemed to spring from a fundamental misunderstanding of the legal process. Scientific conclusions can always be subject to revision, but the law must bring disputes to an end—quickly if possible, but to an end. A conjecture that is probably wrong (as most new conjectures are) will eventually be tested and shown to be so, which itself advances science. But a conjecture that is probably wrong will not help a legal fact-finder reach a conclusion. If the courts sometimes refuse to admit evidence based on a theory that eventually is vindicated, no harm is done to science. The *Daubert* decision apparently intends to give jurors and parties the benefit of considering only probably right theories and requires courts to choose such evidence by thinking like scientists.

This is a flexible approach to admitting scientific evidence. How is it likely to work in practice? Most likely as well as lawyers and judges want it to work. If both sides are wide-awake, it will probably work well. If the lawyer opposing admission of dubious evidence doesn't understand the basics of scientific practice, and the trial judge doesn't want to think carefully about the issues, then fringe scientists will slip through now and then. It will be up to the lawyers to educate both judges and jurors about what constitutes good science. At the least, *Daubert* means that presenting an impressive résumé is no longer enough—experts will find their methods and reasoning under examination as well.

—*John A. Thomas*

John A. Thomas is an attorney with a practice in Grand Prairie, Texas. He reported on the "junk science" legal controversy in our Fall 1992 issue.

Astrologer Ordered to Pay Newspaper's Legal Fees

A Madison, Wisconsin, astrologer lost a libel suit against Madison's leading alternative weekly newspaper and was ordered to pay the newspaper's legal fees incurred in defending itself.

Vince O'Hern, publisher of the newspaper, *Isthmus*, estimated that its attorney's fees were "in the neighborhood of $10,000." But O'Hern said that, while the money was important, "the greatest benefit would be to prevent frivolous suits like this in the future."

The astrologer, Neil Marbell, sued the newspaper, two editors, and a writer, Richard Russell, for a January 11, 1991, opinion column by Russell that called astrologers "purveyors of hogwash." Russell wrote that astrol-

ogers were "deluded" and "charlatans" and said that people should "never, ever under any circumstances give money to astrologers."

Although the article did not mention Marbell, he sued the newspaper, alleging the column was "false, malicious, defamatory, and libelous." He sought $12 million in damages, $1 million for every sign in the zodiac, an *Isthmus* source told a *Capital Times* reporter.

Marbell said he was the only local astrologer with his own office and a listing in the telephone book.

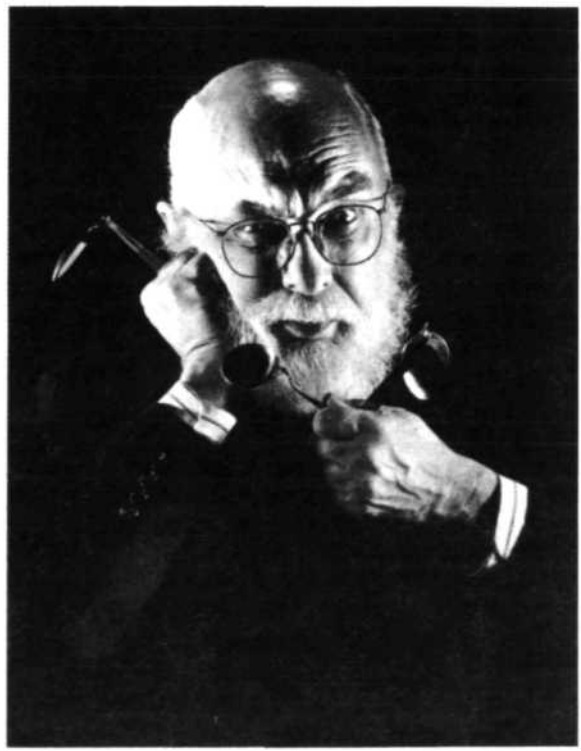
On August 27, 1993, Judge Mark Frankel ruled for the second time in favor of *Isthmus*, both in awarding attorney's fees and rejecting Marbell's motion to reconsider the judge's May 28, 1993, ruling dismissing the suit.

Marbell said he considered the suit "absolutely not frivolous." Publisher O'Hern said: "[The] case obviously had no merit. His purpose was to harass us and cost us as much money as he could. We feel justice was served."

—*K.F.*

Media Notes: Randi's 'Secrets of the Psychics' on NOVA; 'Frontline' Exposes FC

Bravo to James "The Amazing" Randi, NOVA, and WGBH/Boston for the one-hour NOVA documentary "Secrets of the Psychics," televised nationally on October 19. The irrepressible Randi, ever the voice of reason, hosted the program and showed time and again how proclaimed psychic abilities fail to stand up to his expert skeptical scrutiny. He showed how to bend spoons and do psychic surgery, recounted how he exposed the fakery of Peter Popoff, and had psychologist Ray Hyman demonstrate how palm reading works equally well whether one gives the "right" answer or its opposite. The second half of the show was taped in Moscow. There the proponents



NOVA/Franco Ferondi

Randi: Bending spoons, exposing secrets, stimulating minds.

were fresh to Western viewers, but the results were the same. Proponents of psychically charged water amusingly rationalized away any attempt to test their claimed abilities to distinguish it from ordinary water. Two middle-aged women doing a psychic reading of a man via his photograph said all sorts of wonderful things about serial murderer Ted Bundy. They also failed to discern that he is dead (executed four years ago). This show, written and produced by Carl Charlson, belatedly atones for an earlier NOVA program, "The Case of ESP" (reviewed in *SI*, Summer 1984), which lacked NOVA's usual scientific care and skepticism. And it was good to see Randi in such a well-produced showcase of his investigative skills and rationalist philosophy.

* * *

Immediately following NOVA that evening, on PBS's "Frontline," was an excellent critical investigation of Facilitated Communication (see *SI*, Spring 1993). (FC is being used as an aid for autistic individuals and others with limited communication skills. A facilitator supports the subject's pointing finger, or hand or arm, as he or she strikes the letters on a typewriter or a computer keyboard to compose a word or message.)

"Frontline" showed double-blind demonstrations in which subject and facilitator were shown *different* photos. In each situation, it was the object viewed by the facilitator that was described in FC, not the one seen by the autistic patient. Clearly it was the facilitator who was doing the "communicating." In another case, the facilitator swiftly guided an autistic youngster's fingers to punch the correct sum of two numbers, despite the fact that the child was looking away and clearly paying no attention. Nevertheless, some hopeful parents and FC's main proponent, Douglas Biklen, couldn't bring themselves to acknowledge the lesson shown. Written, produced, and directed by Jon Palfreman, the program was an extraordinarily revealing report, a vivid portrayal of subconscious wishful thinking.

* * *

Veteran CBS News anchorman Dan Rather had unkind words for television news in a speech to the Radio and Television News Directors Association at a meeting in Miami. He criticized TV news's "fuzz and wuzz, cop-shop stuff" intended to compete not with other news programs but with entertainment shows, "including those posing as news programs," for "dead bodies, mayhem, and lurid tales."

Rather specifically had strong criticism for CBS's airing of the creationist pseudoscientific pseudodocumentary "The Incredible Discovery of Noah's Ark." He singled out the television executives who "freely take an hour that might have been used for a documentary and hand it over to a quote-unquote 'entertainment special' about the discovery of Noah's Ark that turns out to be a 100-percent hoax."

Ironically, Rather's remarks came on the same day that CBS announced that it would broadcast an hour-long TV special based on headlines in the *Weekly World News*, the most outlandish of all the supermarket tabloids.

—*Kendrick Frazier*

☐ *The Girl with the X-Ray Eyes*

Some time ago, while I was trying to put some order into my video library, I came upon a videocassette without any label to suggest its content; so I decided to put the tape in the VCR and find out what it was. It was the recording of a TV show on the paranormal called "Incredible," aired a few years ago by RAI-TV, the Italian network. I had never seen it, and I later found out that my sister had taped it while I was living in the United States, studying with James Randi.

The discovery proved to be most interesting.

I had read and heard about the achievements of a young Spanish girl named Monica Nieto. According to newspapers and books on the paranormal, she appeared to be able to bend metal and see through solid objects. From the descriptions, she seemed to be another mini-Geller, as the imitators of self-proclaimed psychic Uri Geller are called; enthusiastic reports told of her ability to bend metal rods in sealed glass tubes, and spoons and forks, under the eyes of the onlookers. Others said that the bending never occurred when anyone was looking (remember the shyness effect of Professor John Taylor?), it only happened a long time after Nieto had taken the object in her hands and had played with it. Sometimes she would leave the room with a tube for a while and then return, hiding its contents with her hands and revealing later that the metal inside it had bent; other times she would dance, holding the object in her fists and close to her body, which precluded anyone's seeing it.

Jose L. J. Pena, the former vice-president of the *Sociedad Espanola de Parapsicologia* (SEDP), who conducted an investigation on Nieto's claimed powers, said that he believed she could bend the lighter strip of metal enclosed in the glass tube by shaking it vigorously while dancing and that any sound would be covered by the loud music she plays "for concentration."

Besides these more conventional effects, Nieto was noted for another special ability—reading messages inside closed containers. The descriptions I found were very vague and did not allow any speculation. That's when the videotape came to my help.

The "Incredible" show was on PK (psychokinesis), and after interviews with some parapsychologists who attempted to explain what PK was supposed to be, there came a documentary on Monica Nieto. It had been shot in her own house in Caceres, Extremadura (Spain), and showed an adolescent girl obviously enjoying the attention. The hostess of the show, actress Maria Rosaria Omaggio (a would-be Shirley MacLaine), said that Nieto had never before shown her abilities on television and that she was very happy to do it for Italian television.

Nieto then proceeded to demonstrate metal bending—well, almost. In the first demonstration, one could see the hostess walking in the streets of Caceres with Nieto holding a glass tube with a metal rod inside it and hear a voice in the background telling Nieto's story. At the end of the walk, the metal is taken out of the tube and shown to be bent: incredible!

Next we are in Nieto's house. Here a parapsychologist explains how Nieto had been thoroughly studied by a commission that included a physicist,

a biologist, an engineer, a priest, and a parapsychologist—no conjurors—and all of them had been convinced of the psychic nature of her powers. Nieto is then asked to bend a piece of metal in front of the camera; the rod is placed in the tube and a cork placed on top of it—not sealed, only placed; she takes the tube with her two hands and suddenly the image on the screen freezes and fades away! After a while (how long, we don't know), Nieto's image returns; she is still seated with her hands on the tube, but now the metal inside is bent.

What had happened during the interval? Had it been possible for her to leave the room or do something else that didn't appear important enough to be included in the documentary? Did she go on and on sitting with the tube, thus forcing the cameramen to stop taping? Who knows? They don't tell us.

Finally comes the most revealing part of the show, the X-ray eyes demonstration. The hostess shows a few pieces of paper with names of colors or Spanish phrases written on them. A handmade cardboard box is introduced, and one of the pieces of paper, chosen at random, is placed inside the box, face down. A lid is placed on the box, which is then given to the girl.

Seated in an armchair with a long back and wings at the sides of her head, she manipulates the box very close to her face, rotates it, turns it upside-down, and presses it; most of the time she is looking not at the box but at the experimenters' faces. What is very clear in the film is that she raises the lower part of the box with her thumbs and reads the note while she misdirects the attention of the spectators by sudden moves and requests like: "Can I turn the music on? It helps me." After a while she announces her guess, obviously correct.

Nieto had finally demonstrated herself to be a trickster. She surely enjoys all the attention she gets from the media; in an interview she is quoted as saying, "I like very much to be in the magazines, with pictures and all the rest." In her view there is surely nothing wrong with fooling some adults and gaining popularity. What is certainly wrong is the attitude of those who present the case to the audience as inexplicable and don't suggest that there is an alternative explanation for it. A correct procedure would have been to call in a professional conjuror to comment on the video. Well, incredible as it may seem, they did; but this proved to be more confusing than anything else.

The conjuror was a very popular one with TV audiences in Italy and was also known for his attempts to be credited as a Geller-like psychic. He asked where the box came from and if it was transparent; when the hostess answered that she herself had brought the box and that it was not transparent, he declared that the only possible explanation was clairvoyance. A conjuror, he explained, could do the same thing, but only if he could control the game (which was exactly what Nieto had done). He then proceeded to perform his version of the trick, which in reality was nothing like the one used by Nieto. This, I think, is the kind of thing that persuades people of the reality of psychic phenomena. Here was a famous conjuror declaring that there was no possible trick, *ergo* the girl really had psychic powers!

—Massimo Polidoro

Massimo Polidoro is a conjuror and the investigator for the Italian Committee for the Investigation of Claims of the Paranormal (CICAP), P.O. Box 60, 27958 Voghera (PV), Italy.

European Skeptics Focus on Alternative Medicine

The Fifth European Skeptics' Conference, sponsored by the U.K. Skeptics, was held at Keele University, Stoke-on-Trent, England, from August 29-31, 1993. Titled "Alternative Medicine: Science or Illusion?" the meeting was held in conjunction with the British Association for the Advancement of Science's annual Science Festival.

The first speaker was Peter May, a physician who spearheaded an inquiry by Britain's Independent Television Network (ITN) into the miracle claims of American faith healer Morris Cerullo. Cerullo has held several widely advertised "missions" in London in recent years. May followed up on about a dozen of the supposedly healed, six of whom had been identified by Cerullo's organization. Even among the faith healer's hand-picked "best cases," no evidence could be found of a miraculous or paranormal healing.

John Maddox, editor of *Nature*, and Paul Kurtz at Keele University.

John Maddox, editor of the British science journal *Nature*, co-chaired the morning session on Monday, August 30, with CSICOP chairman Paul Kurtz. In his introductory remarks, Maddox spoke movingly of the impact of alternative medicine, the risks faced by patients who opt for nontraditional care, and the role of critical inquiry in the ongoing debate over alternative therapies.

That afternoon, Robert Morris, Koestler Professor of Parapsychology at the University of Edinburgh, frankly examined issues current in his field. Morris suggested that parapsychologists have become less eager to document alleged paranormal events and more interested in studying conditions under which observers *think* they have perceived a paranormal event.

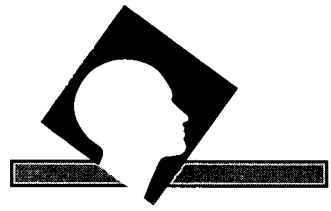
Susan Blackmore, a frequent speaker at international skeptics' meetings, reviewed her research into near-death experiences (NDEs). Blackmore hypothesizes that subjective experiences characteristic of the NDE arise entirely because of physical processes in the brain undergoing trauma. Nonetheless, people who have had NDEs often experience a genuine transformation in their values, life plans, and worldviews.

Paul Kurtz spoke on the growth of antiscientific attitudes in North America and Europe, examined possible psychological and sociological explanations for this phenomenon, and surveyed the options available to skeptics who wish to defend reasoned inquiry.

Tuesday, August 31, was devoted to informal workshops on subjects ranging from pseudoscience in the film *Jurassic Park*, to pseudoscience in U.S. social work practices, to the "scarab beetle" and "exploding bookcase" anecdotes of Carl Jung.

—*Tom Flynn*

Notes of a Fringe-Watcher



MARTIN GARDNER

Pealeism and the Paranormal

"Pray Big! Believe Big! Act Big!"

—Norman Vincent Peale

Norman Vincent Peale, the "minister to millions" who burst into prominence in 1952 with his block-busting best-seller *The Power of Positive Thinking*, is the subject of an excellent unauthorized biography by Carol V. R. George, professor of history at Hobart and William Smith Colleges. Titled *God's Salesman*, and published in 1993 by Oxford University Press, it is the first detailed, objective account of Peale's life and his influence on American Protestantism.

Throughout her book George refers to her subject's views as "Pealeism," a term he intensely dislikes. Actually, his central themes are not a new ism. They repeat over and over again, with endless anecdotes, in sermon after sermon and book after book, the basic ideas of New Thought. This was a religious movement that flourished in the decades before and after 1900 and is still being preached in some hundred off-beat churches around the nation. With roots in the transcendentalism of Emerson, and sparked by the teachings of a Maine faith-healer named Phineas Quimby, New Thought generated an enormous number of books and periodicals, of which the most influential was Ralph Waldo Trine's *In Tune with the Infinite*. You'll find a history of New Thought, with emphasis on its promotion by the poet Ella Wheeler Wilcox, in the last chapter of my biography of Mary Baker Eddy, just published by Prometheus Books.

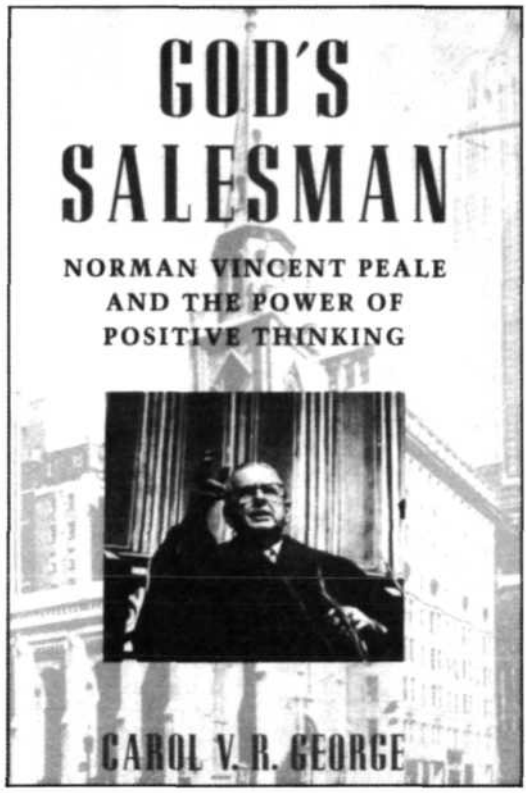
Christian Science and Unity were the two most successful spin-offs from New Thought, both with elements that are major aspects of Pealeism. "I think Christianity is truly a science," Peale said in a 1971 sermon, "and I believe the church is a laboratory in which the science is demonstrated." Mrs. Eddy couldn't have said it better.

The essence of Pealeism is this: If you accentuate the positive, eliminate the negative, pray fervently to a personal God, and "picturize" in your mind your goals (one of Peale's books is titled *Imaging*), miracles will occur in your life. You will be healthier, happier, and make lots more money. Indeed, *The Power of Positive Thinking* made Peale an instant millionaire. It is easy to understand its appeal to businessmen and sales personnel. George quotes Peale as saying that if he hadn't become a preacher, he would have been a salesman.

George skillfully explains why Peale's "feel good" Christianity aroused so much ire among both conservative and liberal Christians.

Liberals were especially annoyed by Peale's far-right political opinions, and especially by his energetic efforts to block John Kennedy's nomination. Peale actually thought that Kennedy's election would mean Vatican control of our politics. He later apologized for this. "I've never been too bright, anyhow," he told his congregation when he offered to resign as pastor.

Liberals were also annoyed by Peale's lifelong friendship and admiration for Richard Nixon. The Nixons attended Peale's church whenever they were in New York, and it was Peale who married Julie Nixon to Eisenhower's grandson. "I think Kennedy is a jerk," Peale wrote in a letter that George cites. In 1984 President Reagan pinned on Peale the Presidential Medal of Freedom. "Dr. Peale and I disagree on everything, religiously and politically," Reinhold Niebuhr told *Time* (September 19, 1960). During Peale's campaigning for Eisenhower's election, Adlai Stevenson, speaking in St. Paul, said he found Paul appealing and Peale appalling.



Born-again Christians were equally appalled by Peale's refusal ever to mention such doctrines as the Virgin Birth, the bodily Resurrection of Jesus, the Incarnation, and the blood atonement. As to what Peale actually believes about such dogmas it is impossible to tell. It is this theological fogginess that so infuriates both liberal and conservative Christians, even though the fogginess has enabled Peale to keep one foot in and one foot out of both camps. George quotes a marvelous answer that Peale gave to an inquiry about his theological beliefs:

> "I'm a conservative, and I will tell you exactly what I mean by that. I mean that I have accepted the Lord Jesus Christ as my personal Savior. I mean that I believe my sins are forgiven by the atoning work of grace on the cross." Then he added, "Now I'll tell you something else. . . . I personally love and understand this way of stating the Christian gospel. But I am absolutely and thoroughly convinced that it is my mission never to use this language in trying to communicate with the audience that has been given me."

Here is how Peale answered a similar question about his debt to New Thought: "They think I am one of them, but I am not. Actually, I am not opposed to it."

This is not the place to discuss Peale's vague theology. Instead I shall focus on a little known aspect of his beliefs that receives only the following brief paragraph in *God's Salesman:*

To those who claimed that the power of unconscious mind was a form of "clairvoyance," he explained it as "spiritual telepathy" accomplished by "the passage of God's thoughts through the mind." It was rather like Emerson's transparent eyeball. Peale studied the literature of psychic research and was familiar with J. B. Rhine's experiments at Duke University. With neither embarrassment nor hesitation, he revealed in sermons and speeches his personal experiences with psychic phenomena. Most of his references were to encounters with intimates who had died, such as the time he felt the touch of his mother's hand on his head after her death, or when he saw his father's vigorous image approaching him on the platform at Marble Church, or when he recognized his deceased brother Bob smiling at him and greeting him through a brick wall at the Foundation for Christian Living. And there were many others to which he bore witness, at least one of which was picked up and headlined by the sensational *National Enquirer*. Within his Easter sermons orthodox and alternate perceptions of death often competed, with a traditional view of the resurrection sharing place with a metaphysical understanding of death as movement to another level of existence.

Peale's book *The Amazing Results of Positive Thinking* has a chapter on extrasensory perception titled "How to Live with the Spiritual Forces Around You."

In "Why I Believe in Life After Death," an article in Peale's monthly magazine *Guideposts* (April 1977), he described the visitation by his dead father:

> And just last year, when I was preaching at a Methodist gathering in Georgia, I had the most startling experience of all. At the end of the final session, the presiding bishop asked all the ministers in the audience to come forward, form a choir and sing an old, familiar hymn.
>
> I was sitting on the speakers' platform, watching them come down the aisles. And suddenly, among them I saw my father. I saw him as plainly as I ever saw him when he was alive. He seemed about 40, vital and handsome. He was singing with the others. When he smiled at me and put up his hand in an old familiar gesture, for several unforgettable seconds it was as if my father and I were alone in that big auditorium. Then he was gone, but in my heart the certainty of his presence was indisputable. He was there, and I know that some day, somewhere, I'll meet him again.
>
> We don't try to prove immortality so that we can believe in it; we try to prove it because we cannot help believing in it. Instinct whispers to us that death is not the end; reason supports it; psychic phenomena uphold it.

Interviewed by the *National Enquirer* (July 5, 1983) Peale described another ghostly visitation in 1970. He was addressing a group in Pawling, New York, where he lives, when he distinctly saw his dead brother Bob walking outside the building. The apparition appeared behind "two solid walls. . . . I had seen him right through those walls."

In a 1957 interview with the *American Weekly*, reprinted in Martin Ebon's anthology *The Psychic Reader* (1969), Peale recalled a visitation by the spirit of his departed mother. The day after she died a badly shaken Peale put his hands on his Bible, hoping to gain strength. "Suddenly I felt two cupped hands laid on the top and back of my head." He did not turn to look, but he knew telepathically that his mother was saying, "Everything is all right, Norman. I am happy. This is a

wonderful place. Do not grieve for me."

Recalling this incident in his *Guideposts* article cited above, Peale wrote: "An illusion? A hallucination caused by grief? I don't think so. I think my mother was permitted to reach across the gulf of death to touch and reassure me."

Peale told the *American Weekly* about a later visitation by his mother that took place outside a New Jersey restaurant. He was feeling guilty about having paid $400 for two hurricane lamps to give his wife as a surprise. Peale had left the restaurant ahead of Ruth when he heard in his mind his mother say: "Norman, don't worry about the lamps. They will please Ruth. She deserves them, she is so wonderful."

Peale began sobbing uncontrollably. He and Ruth drove several miles on their way to New York before he could tell her what had happened:

> "Why did my mother come through to me at such a time and place, about so relatively trivial a matter? I don't know. I do not think I am unstable or neurotic. I believe I have my feet on earth. It wasn't grief that sent me out of control, it was an amazed feeling of being in the presence of an overwhelming force.
>
> "My feeling of the reality and importance of these experiences has grown ever since my mother's death. Just now I am waiting, with a sense of expectancy, for a communication from a friend of mine, a very tough-minded, skeptical nurse, who had often told me of extra-sensory demonstrations she had witnessed in line of duty and with whom I had an agreement that the first of us to die would try to communicate with the other. She died last Saturday. So, I am waiting—not too confidently. But still I wouldn't be surprised."

Peale has always been a firm believer in the reality of near-death experiences, or what are now called NDEs. As he wrote in *Guideposts:*

> Time and again it has been reported of people on the brink of death that they seem to become aware of a great radiance or hear beautiful music or see the faces of departed loved ones who are apparently waiting for them across the line. Are these just hallucinations? I don't think so. Several such episodes have happened within my own family.

Asked by *American Weekly* if he believed science would someday prove there is life after death, Peale answered: "Let us hope so. When it comes it will be the greatest scientific discovery ever made. But I don't have to wait. Mother told me all I need to know."

I am in debt to reader Chris Niemeyer for calling my attention to constant proclamations of paranormal events in the pages of *Guideposts.* They strongly resemble the testimonies at the back of Mrs. Eddy's *Science and Health,* but go even deeper into the miraculous.

Niemeyer began his letter by recalling testimonies he had read in *Guideposts* at a time when he believed them. One told of a woman who experienced the stigmata—one of her hands miraculously began oozing blood. Another was about a woman who had been shot by a thief. Wounded and trying to escape to her car, she was confronted by a fence. Too weak to climb over the fence, she prayed for help. A cloud enveloped her and lifted her over. In another testimony, a woman described her visit with a friend to a beautiful garden at a religious retreat, tended by a nun. Later she learned that the retreat had no such garden, and no nun in residence. Her friend confirmed their

visit to the garden.

Has *Guideposts* stopped publishing such incredible tales? To find out, Niemeyer went to the public library to check 1993 issues. In the January issue a man wrote about praying on a ship for guidance about tithing. He felt strangely impelled to send his pastor a check to give to one of his old, bedridden Sunday school teachers. The pastor wrote back that the money was the exact amount needed for a new hearing aid. "She had ordered it C.O.D.," said the pastor, "but now couldn't afford it. Without your gift the post office would have had to return it." The sender of the check told *Guideposts:* "Suddenly I knew what—or rather Who—made me do what I did."

The February issue ran a testimony from a woman whose son Mark had been murdered. After the murderer's trial, she visited the local newspaper office to pick up back issues with editorials about the trial that she wanted to send to relatives. She was astounded to see that one paper contained a crossword puzzle that had been completely solved in Mark's handwriting! After putting away some groceries, she returned to the paper only to find that the puzzle's solution had vanished. She took this as a sign from God that her son's life, unfinished on earth, had been completed in heaven.

The April issue printed a letter from a man whose car had stalled on a two-lane highway. He got out and tried to start the car by pushing it while his wife sat in the driver's seat. As he stepped behind the car his wife called out "Jake!" He leaped out of the way just before a car crashed into the back of the stalled Chevy. Both cars were totaled. The husband, who had been knocked unconscious, awoke in a hospital with his uninjured wife beside him. If she had not called out his name, he would have been killed. The wife was puzzled. "I didn't say anything," she told Jake. "I was so frightened, my lips were clamped shut."

Thousands of such testimonies in *Guideposts* have implied similar paranormal events, usually in response to prayers. Could it be that this mystical, paranormal aspect of the magazine accounts for its circulation of about four million, exceeding that of *Newsweek?*

Readers of *Guideposts* apparently take all such anecdotes seriously. Today millions still take them seriously in the preaching and writing of Peale's most famous protégé, the Reverend Robert Schuller, whose Crystal Cathedral far outglitters Peale's drab Marble Collegiate Church on Fifth Avenue in Manhattan. As far as I can tell, Schuller's theology differs from Peale's in only one respect. What Peale calls "positive thinking" Schuller calls "possibility thinking."

"No book on the life of Norman Vincent Peale could be less than motivating, inspiring, life-changing," reads Schuller's blurb on the jacket of *God's Salesman.* "Dr. Peale is one of the 20th century's most remarkable and influential persons. As an author, motivator, minister and positive persuader, he changed my life and my ministry." □

Psychic Vibrations

The Montauk Project and the Delphi Experiments

ROBERT SHEAFFER

People always think of the western states as the region where exciting events like flying-saucer crashes and harmonic convergences take place, but Long Island, New York, is fast emerging as a center of paranormal activity. Not only did a saucer allegedly crash near Yaphank (see this column, Fall 1993), but it is also claimed that at the abandoned Air Force base in Montauk, Long Island, the U.S. government performed lurid psychic experiments of a kind that might have sprung from the twisted mind of the Marquis de Sade.

Writing in the *Sedona Journal*, self-described psychic and channeler Helga Morrow gives a melodramatic account of her recent investigation of alleged time-travel experiments that are said to have taken place there in the 1950s and 1960s. Recently she, accompanied by Al Bielek, Preston Nichols, and Duncan Cameron, who were allegedly once involved in these experiments, claim they somehow slipped into the closed-off area and down into a subterranean "chamber of horrors." She describes "cages" in which the unwilling subjects of the experiments—young adolescent boys—were kept. Her perfectly understandable fear was lessened by the presence of her guardian "angels," who she affirms were "with me, protecting and guiding me" the whole time. According to Bielek, Cameron, and Nichols, the boys in the cages were repeatedly tortured, raped, and sodomized into total sexual submission. Why was this done? Apparently the mental shock of tortures, applied right at the moment of adolescent sexual climax, was discovered to be capable of opening up holes in the space-time continuum, allowing objects or even persons to pass through.

Later it was found possible to achieve the same effect with computers alone, by somehow "interfacing"

an IBM 360 with the Cray 1, which did not yet exist. When the two computers were supposedly connected, Cameron produced via his own mind-power an uncontrollable 25-foot monster that went storming about smashing buildings. All attempts to destroy the monster failed. Fortunately, it was "sent into hyperspace, to another time."

Al Bielek and some other pioneers were once allegedly sent forward to the year 6737. There they saw a "golden horse" amid the apparent ruins of dead civilization. The intrepid voyagers were instructed to remain within a circle with a 20-foot radius, or else they could not return. "Unfortunately," writes Morrow, "many were lost in time for eternity."

Today, "the technology for sending an animal, person, or thing into another time can fit into an ordinary briefcase," according to Morrow. In certain circles, the "Montauk Project" is a hot product. Peter Moon and Preston Nichols have written a book, *The Montauk Project: Experiments in Time.* Al Bielek is selling a video, *Montauk Lecture.* A "Global Sciences" conspiracy-oriented conference was held in Denver, with Morrow a featured speaker. Preston Nichols and Duncan Cameron are business partners in something called "Space-Time Labs, a fully equipped manufacturer of psychoactive electronic equipment." *Caveat emptor.*

* * *

Do you remember the "remote viewing" experiments that were all the rage in the 1970s? One of the highest-scoring stars of "remote viewing" at SRI International in Menlo Park was Keith "Blue" Harary. Harary and Russell Targ jointly wrote *The Mind Race* (1984), about their remote-viewing efforts. Harary began his career in parapsychology as an out-of-body traveler. When the late parapsychologist D. Scott Rogo wanted to confound skeptics by proving that paranormal effects could be produced at will, he wrote:

> In 1972 a young psychology student at Duke University wandered into the offices of the Psychical Research Foundation in Durham, N.C. His name was Blue Harary and he claimed he could leave his body at will. . . . Blue was placed in one room and, at a randomly selected time, was asked to send his mind to an adjoining room where the kitten was being observed by another experimenter, who did not know the time when Blue would attempt to project to the animal. . . . The kitten invariably became less active and less vocal during those times when Blue was projecting to it. . . . So, despite what Dr. Sagan tells you, successful tests have been conducted with astral projectors under controlled conditions, under double-blind conditions and with skeptics present. (*Fate*, April 1980)

Now, seeking to escape his onetime fame as a psychic, Harary flatly disavows any claim to special powers and rejects with scorn Targ's statements about his former psychic rapport with cats (*SI*, Spring 1991, p. 331; *Journal of the American Society for Psychical Research*, 86:400, 403).

The high-water mark of the entire "remote viewing" fad was undoubtedly the alleged successful attempt of Harary and Targ to predict the prices of December 1982 silver futures on commodity markets (*SI*, Winter 1984-85, pp. 118, 125). This effort, under the auspices of their incorporated venture, Delphi Associates, supposedly generated under tight experimental controls nine consecutive correct predictions of the silver market's direction and strength. The

odds against this happening by chance were claimed to be more than 83,000 to 1. John White, the principal investor, turned a substantial profit, which made headlines worldwide, even gaining Delphi a favorable depiction on the NOVA program "The Case for ESP" (1984) for a supposedly genuine paranormal feat. Targ began ecstatically speculating how, within 12 months, Delphi could corner not only the silver market but a fortune greater than the U.S. Gross National Product.

Then, just as remarkably, Delphi Associates' remote-viewing program disintegrated, little more was heard from them, and the remarkable success was never repeated. The relationship of the two researchers soured, resulting in Harary bringing a $1.5-million suit against Targ for damages resulting from the misuse of his name (this column, Summer 1989), a suit ultimately settled out of court. Now a writer and psychologist living in San Francisco, Harary has finally published his explanation of those events in the *Journal of the American Society for Psychical Research* (October 1992). Harary now insists that all of the Delphi experiments, successful or not, were "informal," and that "every one of [the] essential principles of the formal remote-viewing methodology" was "violated by the manner in which Delphi conducted the associative remote-viewing trials." In attempting to duplicate the reportedly brilliant success of the predictions for December using March silver futures, two incorrect predictions were given to the investor, who subsequently lost much of his earlier profits, as well as all further interest in investing through Delphi.

Why did they go wrong? Targ suggests that "displacement" had occurred: Harary's remote perception of the target had been accurate, but was somehow displaced from the

current one. Harary, however, thinks that he described the first of the March targets correctly—a miniature golf course—but it may have been mistakenly matched by the judges with another target, the San Francisco zoo, possibly because they were thrown off the track by his comment about the smell of roasted peanuts. The second target he missed because, well, *nobody* is ever 100-percent accurate in such things.

If this is correct, then Harary would have us believe that (*a*) he made an incredible 13 consecutive correct predictions of future price movements of silver, in spite of (*b*) all the experimental procedures having been done incorrectly, and also in spite of (*c*) his not being psychic and (*d*) his having no interest whatsoever in anyone's future attempts to make money in this manner. I fail to see how all these can simultaneously be true.

What *really* happened in the Delphi Associates remote-viewing silver futures project? Unfortunately, we'll never know, because Targ says the original data have been lost. □

The New Skepticism

PAUL KURTZ

Skepticism, like all things, is good if used in moderation. It is essential for the healthy mind; but if taken to excess, it can lead to overweening doubt. Skepticism, if properly understood, is not a metaphysical picture of the unknowability of "ultimate reality"; it does not lead to an inevitable epistemological impasse; it need not culminate in existential despair or nihilism. Rather it should be considered as an essential methodological rule guiding us to examine critically all claims to knowledge and affirmations of value. Without it, we are apt to slip into complacent self-deception and dogmatism; with it, if prudently used, we can effectively advance the frontiers of inquiry and knowledge, and also apply it to practical life, ethics, and politics.

Briefly stated, a skeptic is one who is willing to question any claim to truth, asking for clarity in definition, consistency in logic, and adequacy of evidence. The use of skepticism is thus an essential part of objective scientific inquiry and the search for reliable knowledge.

Skepticism has deep roots in the philosophical tradition. The term derives from the Greek word *skeptikos*, which means "to consider, examine." It is akin to the Greek *skepsis*, which means "inquiry" and "doubt."

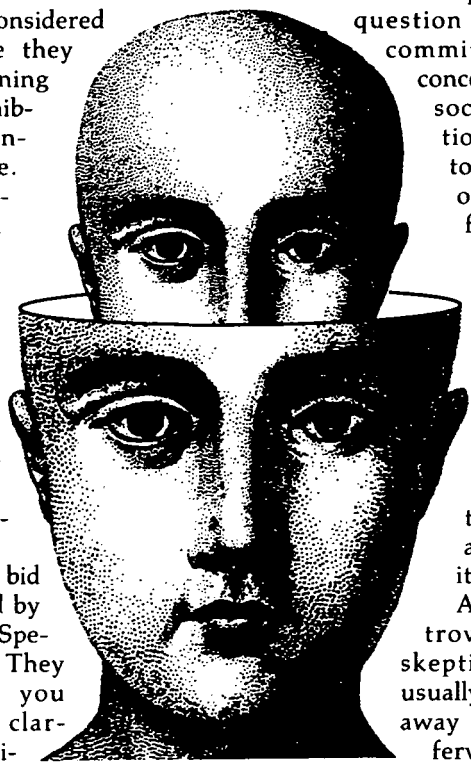
Skepticism provides powerful tools of criticism in science, philosophy, religion, morality, politics, and society. It is thought to be exceedingly difficult to apply it to ordinary life or to live consistently with its principles. For human beings seek certitudes to guide them, and the skeptical mode is often viewed with alarm by those who hunger for faith and conviction. Skepticism is the intractable foe of pretentious

Skeptical inquirers should be open-minded about new possibilities and be willing to question even the most well-established principles in the light of further inquiry.

This article has been adapted from Paul Kurtz's *The New Skepticism: Inquiry and Reliable Knowledge* (Buffalo, N.Y.: Prometheus Books, 1992).

belief systems. When people demand definite answers to their queries, skepticism always seems to give them further questions to ponder. Yet in a profound sense, skepticism is an essential ingredient of all reflective conduct and an enduring characteristic of the educated mind.

Still, skeptics are considered dangerous because they question the reigning orthodoxies, the shibboleths and hosannas of any age. Although the skeptical attitude is an indelible part of reflective inquiry, can a person get beyond the skeptical orientation to develop positive directions and commitments in belief and behavior, and will skepticism enable one to do so?



Skeptics always bid those overwhelmed by Absolute Truth or Special Virtue to pause. They ask, "What do you *mean?*"—seeking clarification and definition—and "*Why* do you believe what you do?"—demanding reasons, evidence, justification, or proof. Like natives of Missouri, they say, "Show me." All too often probing skeptics discover that the unquestioned beliefs and many cherished values of the day rest on quixotic sands and that, by digging at their tottering foundations, they may hasten their collapse. Skeptics are able to detect contradictions within belief systems; they discover hypocrisies, double standards, disparities between what people profess and what they actually do; they point to the paucity of evidence for most of humankind's revered belief systems.

Skeptics are viewed as dissenters, heretics, radicals, subversive rogues, or worse, and they are bitterly castigated by the entrenched establishments who fear them. Revolutionary reformers are also wont to turn their wrath on skeptical doubters who question their passionate commitment to ill-conceived programs of social reconstruction. Skeptics wish to examine all sides of a question; and for every argument in favor of a thesis, they usually can find one or more arguments opposed to it. Extreme skepticism cannot consistently serve our practical interests, for insofar as it sires doubt, it inhibits actions. All parties to a controversy may revile skeptics because they usually resist being swept away by the dominant fervor of the day.

Nevertheless, skepticism is *essential* to the quest for knowledge; for it is in the seedbed of puzzlement that genuine inquiry takes root. Without skepticism, we may remain mired in unexamined belief systems that are accepted as sacrosanct yet have no factual basis in reality. With it, we allow for some free play for the generation of new ideas and the growth of knowledge. Although the skeptical outlook may not be sufficient unto itself for any philosophy of the practical life, it provides a necessary condition for the reflective approach to life. Must skepticism leave us

floundering in a quagmire of indecision? Or does it permit us to go further, and to discover some probabilities by which we can live? Will it allow us to achieve reliable knowledge? Or must all new discoveries in turn give way to the probing criticisms of the skeptic's scalpel? The answer to these questions depends in part on what one means by skepticism, for there are various kinds that can be distinguished.

Nihilism

Total Negative Skepticism. The first kind of skepticism that may be identified is nihilism. Its most extreme form is total negative skepticism. Here I am referring to skepticism as a complete rejection of all claims to truth or value. This kind of skepticism is mired in unlimited doubt, from which it never emerges. Knowledge is not possible, total skeptics aver. There is no certainty, no reliable basis for convictions, no truth at all. All that we encounter are appearances, impressions, sensations; and we have no guarantee that these correspond to anything in external reality. Indeed, we have no assurance that we are properly describing external objects "in themselves." Our senses, which lie at the heart of our experiential world, may deceive us. Our sense organs act as visors, shielding and limiting our perceptions, which vary from individual to individual and from species to species. Similar pitfalls await those who seek to root knowledge in the cognitive intuitions or deductive inferences of mathematics or logic, claim total skeptics. Meanings are irreducibly subjective and untranslatable into intersubjective or objective referents. Purely formal conceptual systems tell us more about the language we are using than about the nature of ultimate reality itself. In any case, human beings are prone to err. For every proof in favor of a thesis, one may pose a counter-proof. Like the web that is spun by a spider, the entire structure may collapse when we disturb the glue that holds the threads together.

Not only is epistemic certainty impossible, maintain total skeptics, the very criteria by which we judge whether something is true or false are questionable. Knowledge is based upon the methods by which we evaluate claims to truth—whether empirical or rational. But these are simply assumed, they insist, and cannot be used to validate themselves without begging the question. Thus we can never get beyond the first stage of inquiry. Total skeptics end up in utter subjectivity, solipsists imprisoned in their own worlds, confused about the nature of knowledge. This is the total skeptics' approach to science, philosophy, and religion.

Nihilistic skepticism has also been used in ethics with devastating results. Here the total skeptic is a complete relativist, subjectivist, and emotivist. What is "good" or "bad," "right" or "wrong," varies among individuals and societies. There are no discernible normative standards other than taste and feeling, and there is no basis for objective moral judgment. We cannot discern principles that are universal or obligatory for morality. Complete cultural relativity is the only option for this kind of skepticism. Principles of justice are simply related to power or the social contract; there are no normative standards common to all social systems. In the face of moral controversy, total skeptics may become extreme doubters; all standards are equally untenable. They may thus become conservative traditionalists. If there are no reliable guides to moral conduct, then the only recourse is to follow custom. Ours is

not to reason why, ours is but to do or die, for there are no reasons. Or total skeptics may become cynical amoralists for whom "anything goes." Who is to say that one thing is better or worse than anything else? they ask, for if there are no standards of justice discoverable in the nature of things, political morality in the last analysis is a question of force, custom, or passion, not of reason or of evidence.

This kind of total skepticism is self-contradictory; for in affirming that no knowledge is possible, these skeptics have already made an assertion. In denying that we can know reality, they often presuppose a phenomenalistic or subjectivistic metaphysics in which sense impressions or ideas are the constitutive blocks out of which our knowledge of the world, however fragmented, is constructed. In asserting that there are no normative standards of ethics and politics, total skeptics sometimes advise us either to be tolerant of individual idiosyncrasies and respect cultural relativity, or to be courageous and follow our own quest to satisfy ambition or appetite. But this imperceptibly masks underlying value judgments that skeptics cherish. This kind of skepticism may be labeled "dogmatism"; for in resolutely rejecting the very possibility of knowledge or value, such skeptics are themselves introducing their own questionable assertions.

Neutral Skepticism

One form of nihilistic skepticism that seeks to avoid dogmatism does so by assuming a completely neutral stance. Here skeptics will neither affirm nor deny anything. They are unwilling to utter any pronouncements, such as that sense perception or formal reasoning is unreliable. They reject any type of skepticism that masks a theory of knowledge or reality in epistemology, metaphysics, ethics, and politics. Neutralists claim to have no such theory. They simply make personal statements and do not ask anyone to accept or reject them or be convinced or persuaded by their arguments. These are merely their own private expressions they are uttering, and they are not generalizable to others. For every argument in favor of a thesis, they can discover a counter-argument. The only option for neutral skeptics is thus to suspend judgment entirely. Here agnosticism rules the roost. They are unable in epistemology to discover any criteria of knowledge; in metaphysics, a theory of reality; in religion, a basis for belief or disbelief in God; in ethics and politics, any standards of virtue, value, or social justice.

The ancient pre-Socratic Greek philosopher Cratylus (fifth–fourth century B.C.) was overwhelmed by the fact that everything is changing, including our own phenomenological worlds of experience; and he therefore concluded that it is impossible to communicate knowledge or to fully understand anyone. According to legend, Cratylus refused to discuss anything with anyone and, since it was pointless to reply, only wiggled his finger when asked a question. The neutral state of suspension of belief, now known as Pyrrhonism, was defended by Pyrrho of Elis and had a great impact on the subsequent development of skepticism. It applied primarily to philosophical and metaphysical questions, where one is uncertain about what is ultimately true about reality, but it put aside questions of ordinary life, where convention and custom prevail. This form of skepticism also degenerates into nihilism, for in denying any form of knowledge it can lead to despair.

Mitigated Skepticism

There is a fundamental difficulty with the forms of skepticism outlined above, for they are contrary to the demands of life. We need to function in the world—whatever its ultimate reality—and we need to develop some beliefs by which we may live and act. Perhaps our beliefs rest ultimately upon probabilities; nevertheless we need to develop knowledge as a pragmatic requirement of living and acting in the world. A modified form of skepticism was called *mitigated skepticism* by David Hume, the great eighteenth-century Scottish philosopher. It is a position that was also defended by the Greek philosopher Carneades of the second century B.C. Mitigated skeptics have confronted the black hole of nothingness and are skeptical about the ultimate reliability of knowledge claims. They are convinced that the foundations of knowledge and value are ephemeral and that it is impossible to establish ultimate truths about reality with any certainty. Nonetheless, we are forced by the exigencies of practical life to develop viable generalizations and to make choices, even though we can give no ultimate justification for them. One cannot find any secure basis for causal inferences about nature, other than the fact that there are regularities encountered within experience, on the basis of which we make predictions that the future will be like the past. But we have no ultimate foundation for this postulate of induction. Similarly, one cannot deduce what *ought* to be the case from what is. Morality is contingent on the sentiments of men and women who agree to abide by social convention in order to satisfy their multifarious desires as best they can.

Mitigated skepticism is not total, but only partial and limited, forced upon us by the exigencies of living. It would be total if we were to follow philosophy to the end of the trail, to irremediable indecision and doubt. Fortunately, we take detours in life, and thus we live and act *as if* we had knowledge. Our generalizations are based upon experience and practice, and the inferences that we make on the basis of habit and custom serve as our guide.

Unbelief

The term *skepticism* has sometimes been used as synonymous with *unbelief* or *disbelief* in any domain of knowledge. Actually there are two aspects to this—one is the *reflective* conviction that certain claims are unfounded or untrue, and hence not believable, and this seems a reasonable posture to take; the other is the negative a priori rejection of a belief without a careful examination of the grounds for that belief. Critics call this latter form of skepticism "dogmatism." The word *unbelief* in both of these senses is usually taken to apply to religion, theology, the paranormal, and the occult.

In religion the unbeliever is usually an atheist—not simply a neutral agnostic—for this kind of skepticism rejects the claims of theists. The atheist denies the basic premises of theism: that God exists, that there is some ultimate purpose to the universe, that men and women have immortal souls, and that they can be saved by divine grace.

Reflective unbelievers find the language of transcendence basically unintelligible, even meaningless, and that is why they say they are skeptics. Or, more pointedly, if they have examined the arguments adduced historically to prove the existence of God, they find them invalid, hence unconvincing. They find the so-called

appeals to experience unwarranted: neither mysticism nor the appeal to miracles or revelation establishes the existence of transcendental realities. Moreover, they maintain that morality is possible without a belief in God. Unbelievers are critics of supernaturalistic claims, which they consider superstition. Indeed, they consider the God hypothesis to be without merit, a fanciful creation of human imagination that does not deserve careful examination by emancipated men and women. Many classical atheists (Baron d'Holbach, Diderot, Marx, Engels) fit into this category, for they were materialists first, and their religious skepticism and unbelief followed from their materialistic metaphysics. Such skeptics are dogmatic only if their unbelief is a form of doctrinaire faith and not based on rational grounds.

In the paranormal field, unbelievers similarly deny the reality of psi phenomena. They maintain that ESP, clairvoyance, precognition, psychokinesis, and the existence of discarnate souls are without sufficient evidence and contrary to our knowledge of how the material universe operates. Some skeptics deny paranormal phenomena on a priori grounds, i.e., they are to be rejected because they violate well-established physical laws. They can be considered dogmatists only if they refuse to examine the evidence brought by the proponents of the paranormal, or if they consider the level of science that has been reached on any one day to be its final formulation. Insofar as this kind of unbelief masks a closed mind, it is an illegitimate form of skepticism. If those who say that they are skeptics simply mean that they deny the existence of the paranormal realm, they are aparanormalists. The question to be asked of them always is, *Why?* For much as the believers can be judged to hold certain convictions on the basis of inadequate evidence or faith, so the dogmatic unbelievers may reject such new claims because these violate their own preconceptions about the universe. This latter kind of skepticism has many faults and is in my judgment illegitimate. These skeptics are no longer open-minded inquirers, but debunkers. They are convinced that they have the Non-Truth, which they affirm resolutely, and in doing so they may slam shut the door to further discoveries.

Skeptical Inquiry

There is yet another kind of skepticism, which differs from the kinds of skepticism encountered above. Indeed, this form of skepticism strongly criticizes nihilism, total and neutral; mitigated skepticism; and dogmatic unbelief—although it has learned something from each of them. This kind of skepticism I label "skeptical inquiry," with inquiry rather than doubt as the motivation. I call it the *new skepticism*, although it has emerged in the contemporary world as an outgrowth of pragmatism. A key difference between this and earlier forms of skepticism is that it is *positive* and *constructive*. It involves the transformation of the negative critical analysis of the claims to knowledge into a positive contribution to the growth and development of skeptical inquiry. It is basically a form of *methodological* skepticism, for here skepticism is an essential phase of the process of inquiry; but it does not and need not lead to unbelief, despair, or hopelessness. This skepticism is not total, but is limited to the context under inquiry. Hence we may call it *selective* or *contextual* skepticism, for one need not doubt everything at the same time, but only certain questions in the limited context of investigation.

It is not neutral, because it believes that we do develop knowledge about the world. Accordingly, not only is human knowledge possible, but it can be found to be reliable; and we can in the normative realm act on the best evidence and reasons available. Knowledge is not simply limited to the descriptive or the formal sciences, but is discoverable in the normative fields of ethics and politics. Although this is a modified form of skepticism, it goes far beyond the mitigated skepticism of Hume; for it does not face an abyss of ultimate uncertainty, but is impressed by the ability of the human mind to understand and control nature.

The new skepticism is not dogmatic, for it holds that we should never by a priori rejection close the door to any kind of responsible investigation. Thus it is skeptical of dogmatic or narrow-minded atheism and aparanormalism. Nonetheless, it is willing to assert reflective *unbelief* about some claims that it finds lack adequate justification. It is willing to assert that some claims are unproved, improbable, or false.

Skepticism, as a method of doubt that demands evidence and reasons for hypotheses, is essential to the process of scientific research, philosophical dialogue, and critical intelligence. It is also vital in ordinary life, where the demands of common sense are always a challenge to us to develop and act upon the most reliable hypotheses and beliefs available. It is the foe of absolute certainty and dogmatic finality. It appreciates the snares and pitfalls of all kinds of human knowledge and the importance of the principles of fallibilism and probabilism in regard to the degrees of certainty of our knowledge. This differs sharply from the skepticisms of old, and it can contribute substantially to the advancement of human knowledge and the moral progress of humankind. It has important implications for our knowledge of the universe and our moral and social life. Skepticism in this sense provides a positive and constructive *eupraxophy* that can assist us in interpreting the cosmos in which we live and in achieving some wisdom in conduct.

The new skepticism is more in tune with the demands of everyday knowledge than with speculative philosophy. Traditional skepticism has had all too little to say about the evident achievements of constructive skeptical inquiry. And derisive skeptical jabs hurled from the wings of the theater of life are not always appreciated, especially if they inhibit life from proceeding without interruption.

Skeptical inquiry is essential in any quest for knowledge or deliberative valuational judgment. But it is limited and focused, selective, and positive, and it is part and parcel of a genuine process of inquiry. This form of modified skepticism is formulated in the light of the following considerations:

There has already been an enormous advance in the sciences, both theoretically and technologically. This applies to the natural, biological, social, and behavioral sciences. The forms of classical skepticism of the ancient world that reemerged in the early modern period were unaware of the tremendous potential of scientific research. Pyrrhonistic skepticism is today invalidated, because there now exists a considerable body of reliable knowledge. Accordingly, it is meaningless to cast all claims to truth into a state of utter doubt. The same considerations apply to post-modernist subjectivism and Richard Rorty's pragmatic skepticism, which I believe are likewise mistaken.

Contrary to traditional skeptical doubts, there are methodological

criteria by which we are able to test claims to knowledge: (*a*) empirical tests based upon observation, (*b*) logical standards of coherence and consistency, and (*c*) experimental tests in which ideas are judged by their consequences. All of this is related to the proposition that it is possible to develop and use objective methods of inquiry in order to achieve reliable knowledge.

We can apply skeptical inquiry to many areas. Thoroughgoing investigations of paranormal claims can only be made by means of careful scientific procedures. Religious claims, using biblical criticism, the sciences of archaeology, linguistics, and history, have today given us a basis for skeptical criticism of the appeals to revelation and theories of special creation.

We have long since transcended cultural relativism in values and norms and are beginning to see the emergence of a global society. Thus extreme cultural subjectivity is no longer valid, for there is a basis for transcultural values. There is also a body of tested prima facie ethical principles and rules that may be generalizable to all human communities.

Therefore, the methods of skeptical inquiry can be applied to the political and economic domain in which we frame judgments of practice. Indeed, it is possible to develop a eupraxophy, based on the most reliable knowledge of the day, to provide a generalized interpretation of the cosmos and some conceptions of the good life.

Doubt plays a vital role in the context of ongoing inquiry. It should, however, be selective, not unlimited, and contextual, not universal. The principle of fallibilism is relevant. We should not make absolute assertions, but be willing to admit that we may be mistaken. Our knowledge is based upon probabilities, which are reliable, not ultimate certainties or finalities.

Finally, skeptical inquirers should always be open-minded about new possibilities, unexpected departures in thought. They should always be willing to question or overturn even the most well-established principles in the light of further inquiry. The key principle of skeptical inquiry is to seek, when feasible, adequate evidence and reasonable grounds for any claim to truth in any context.

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Anthony Standen Dead at 86

Anthony Standen, chemist, editor and scientific gadfly, died in June at 86. Author of *Science Is a Sacred Cow* (1950), an entertaining critique of scientific pomposity, Standen was sometimes considered the founder of the modern skeptics movement in science. However, Standen's writings could also be used by antievolutionists and opponents, not just critics, of science, since about the only fields he considered respectable were physics and math. He had degrees in chemistry and entomology.

Philosophy and the Paranormal

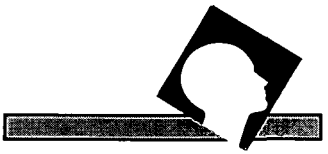
Part 1: The Problem of "Psi"

WILLIAM GREY

Psychic and paranormal claims raise issues in two important domains of philosophical inquiry: *epistemology*, or the theory of knowledge (which examines the nature of knowledge and human understanding and the proper methods by which knowledge may be acquired), and *metaphysics* (which is concerned to provide an account of the basic structure of reality: what sort of world do we inhabit?).

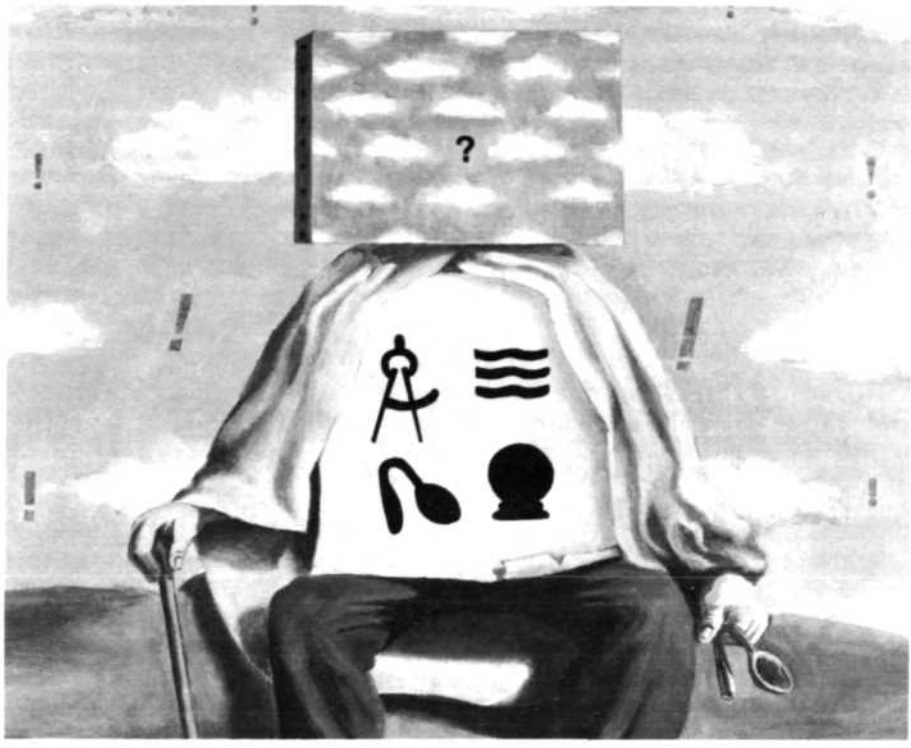
Questions about knowledge and belief have traditionally been central preoccupations of philosophers. In particular, the question of miracles (which I discuss in Part 2 of this article) and the arguments developed by the eighteenth-century Scottish philosopher David Hume (1711-1776) are relevant to the assessment of paranormal claims.

Scientific inquiry provides us with a body of knowledge that purports to explain why things happen as they do: why rivers flow, why plants grow, and so forth. Science, and physics in particular, is an extraordinary triumph of the human mind. Yet despite its achievements, the understanding that science provides has seemed to some people to be unsatisfactory. Science, for example, provides accounts of how things happen in terms of chains of causes that leave no room for some dimensions of human experience—and, in particular, it has been said that science is remiss in ignoring paranormal claims.



Spurious claims like those of astrology or phrenology differ from systematic inquiry in respectable disciplines in that they insulate themselves from criticism.

This is the first of a two-part article examining some fundamental issues raised by paranormal claims.



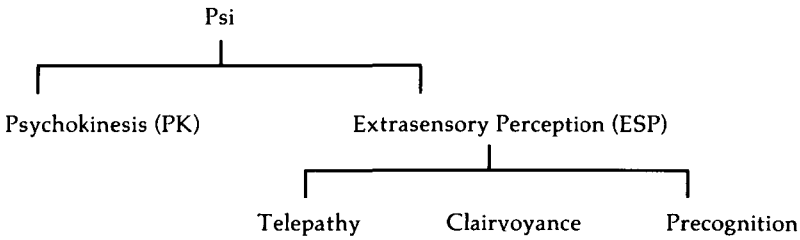
The Nature of the Paranormal

The paranormal (or "psi") encompasses a heterogeneous collection of claims. One reason for this diversity is that paranormal phenomena are typically characterized by exclusion; that is, they comprise what does *not* fit into the accepted categories we use when we try to explain what happens in the world. Given this negative mode of characterization, there is no reason to expect there will be any feature that all supposedly paranormal phenomena share. There are nevertheless some interesting common patterns.

In general, paranormal phenomena involve (or seem to involve) anomalous causal connections between a conscious subject and the world. In the case of extrasensory perception (ESP) it appears that subjects acquire knowledge of their environment through some nonstandard pathway. The causal direction in ESP is from world to subject. In psychokinesis (PK) the subject seems to affect the world through a deviant causal path: the causal direction in this case is from subject to world.

We must carefully distinguish parapsychological experiences and paranormal processes. The former are a phenomenological reality; the latter, a contested hypothesis invoked to explain them. Parapsychology, conceived as the study of paranormal experience, is a legitimate field of empirical inquiry. However, it is an open question whether there are any objectively real paranormal *phenomena* that provide the *basis* for parapsychological experiences. Skeptical conclusions about the existence of psi phenomena should not lead one to deny the veracity of experiences that people characterize as parapsychological. The *experiences* are real enough;

FIGURE 1



what is in dispute is how they are best to be explained.

Paranormal claims present a challenge to the dominant orthodoxy of mainstream science. The Cambridge philosopher C. D. Broad (1887-1971) suggested that parapsychology, an important branch of paranormal inquiry, presents a challenge for at least five deeply entrenched metaphysical assumptions: (*a*) that future events cannot affect the present before they happen (backward causation is forbidden); (*b*) that a person's mind cannot effect a change in the material world without the intervention of some physical energy or force; (*c*) that a person cannot know the content of another person's mind except by the use of inferences based on experience and drawn from observations of his or her speech or behavior; (*d*) that we cannot directly know what happens at a distant point in space without some sensory perception or energy of it transmitted to us; (*e*) that discarnate beings do not exist as persons separable from physical bodies (Broad 1949; cited in Kurtz 1981: 6-7).

Paranormal claims thus challenge some widely accepted beliefs. This in itself is no objection to paranormal claims. After all, many of today's scientific orthodoxies were yesterday's heresies. But, as Hume (1748) insisted, extraordinary claims demand extraordinary evidence. And these are extraordinary claims.

It is not easy to establish a precise meaning for "paranormal." The word suggests something hidden or mysterious, or the operation of a kind of agency or principle that functions outside the normal range of expectation or experience. It also suggests something beyond the scope of currently accepted physical theory. "Paranormal" in this sense is a term recommended—if not coined—by the French-born American philosopher C. J. Ducasse (1881-1969). (See Ducasse 1954.) A rough map of the territory is set out in Figure 1.

Psychokinesis is the power to affect physical happenings through thought, or by an act of will alone, without the mediation of bodily action. Clairvoyance is the ability to acquire knowledge of happenings through means other than the normal sensory channels. Telepathy and precognition could be treated as special cases of clairvoyance, where the knowledge acquired concerns the thoughts of another person (in the case of telepathy) or knowledge of the future (in the case of precognition). In addition to these two broad categories of "psi" phenomena (ESP and PK), there is a third conspicuous area of paranormal concern, which relates to the possibility of experience or existence transcending the temporal or spatial location of our bodies. Questions about "out-of-body experiences," disembodied existence, reincarnation, and the possibility of life after death, are instances of this

kind of concern.

The possible existence of psi phenomena and the implications of such phenomena have generated widespread interest. Psi phenomena raise the possibility of alternative ways of knowing and doing, which we can characterize as alternative epistemologies and alternative technologies. That is, we confront the possibility of radically different ways of acquiring knowledge about the world and radically different ways of doing things.

For example, an orthodox way of finding out about the world is to use observation and experiment, that is, to conduct an empirical inquiry. The scientific method is supposed to provide us with exemplary procedures (which can be set out as a set of methodological canons or principles) that tell us how to find out about the world. But however we characterize the scientific method (its proponents squabble about the details), the defenders of psi usually claim that the currently accepted methods of inquiry are too limited.

Alternative technologies provide alternative ways of doing things or of achieving certain results. Medicine, for example, uses immunization as a technique for disease prevention. That is an orthodox medical technology. Naturopathy and homeopathy are alternative medical technologies. If they are effective, it is important that we know about them, as they can be exploited to provide a cheap means of promoting health and reducing morbidity. If they are useless or positively dangerous, again it is important that we know about them, in order to avoid them. It is therefore important to consider the sorts of principles or criteria that are relevant to determining whether these alternatives make any compelling claims on our attention.

The field of paranormal claims thus divides into deviant ways of acquiring *knowledge* (deviant epistemologies) and deviant ways of *doing* something (deviant technologies). There are those—the "knowers," such as psychics, clairvoyants, psychometrists—who claim to have special powers, or special techniques, for finding out about the unknown, especially the future. Techniques for precognition and prognostication are enormously varied. Alternative technologies (the province of the "doers") include the panoply of perpetual-motion machines, healing techniques (homeopathy, naturopathy), energy polarizers, and the like.

"Parapsychological . . . experiences are real enough; what is in dispute is how they are best to be explained."

To make the discussion manageable, I will consider only claims that are *testable.* If someone, for example, declares that God created the world in 4004 B.C., or that the Shroud of Turin was used to wrap the body of Christ, then we are presented with a claim that can be critically assessed by relating the claim to a body of relevant factual evidence. If, however, it is claimed that there is a benign force that pervades the universe, this is too vague to be tested, and it therefore cannot be the subject of empirical inquiry.

Finally, note that some paranormal claims make more insistent demands on our attention than others. Phrenology (the belief that personality and dispositions are reflected in the conformation of the head) has been thoroughly discredited, although no doubt it still attracts a few adherents. But there are certainly disputed cases.

Meditation, acupuncture, hypnotism, and telepathy, for example, are activities or phenomena whose credentials, many people believe, are unclear. Whether or not the jury is still out may itself be a matter of dispute. There is a fuzzy, and shifting, boundary between epistemologically disreputable fields of inquiry (phrenology, say) and the most impeccably respectable.

The Challenge of Psi

Paranormal claims are a perennial source of fascination. They are of personal interest because many people believe they have had some experience, such as an accurate premonition in a dream or a telepathic message from a loved one, that cannot be satisfactorily explained in the terms that science-based understanding provides. Our physical theories say that the world is at bottom material, and we explain what happens in terms of the recurrent patterns that constitute the physical laws. Sometimes things are known, or happen, that cannot be accounted for in terms of the sort of physical interactions sanctioned by physics. Or so it seems.

This personal interest immediately leads us to the general interest of psi. If there is a dimension of experience that cannot be accounted for with the help of our science-based understanding, this surely shows that physics is at best incomplete—things happen that it is unable to explain. Or perhaps the whole of our science-based understanding is mistaken! Perhaps the principles that determine the way the world works are quite different from what we take them to be.

This general problem—the possible limitations of our scientific worldview—immediately raises metaphysical issues about the sort of things that exist in the world. Physics tells us that there are four forces that govern how things interact—gravity, electromagnetism, and the strong and weak nuclear forces. Are these four enough? Does physical theory provide us with a complete description of reality? It also raises epistemological issues: Can our science-based methods of inquiry be accepted as reliable methods for finding out everything we want or need to know about the world? If not, in what way do they need to be supplemented? In particular, are there other reliable ways of knowing (precognition, clairvoyance, or whatever) that we need to take account of but with which physics is unable to deal? Or maybe there are no physically inexplicable phenomena; perhaps we need to develop a better physical theory to take account of all the details of the world we inhabit.

These topics are important even if it turns out that all claims of paranormal phenomena are completely mistaken. Ducasse (1954: 811) has pointed out that, should this be the case, it tells us something important about delusion and deception, and the proneness of human understanding to fall into error in a particular kind of way.

The Structure of Paranormal Belief

While the belief structures that underlie paranormal claims often seem puzzling and bizarre, they typically turn out to be misapplications of the very same patterns of thought that have helped us to develop some of our best theories about the world. I have suggested elsewhere that superstitious and delusory belief systems are often based on an erroneous belief that an important layer of underlying structure in the world has been identified through the discovery of some important new invariant prin-

ciple (Grey 1988).

Take a clear instance of a pseudoscience, say astrology. This is a delusory belief system, by which I mean a set of claims about why things happen as they do that turns out, on inspection, to have no foundation. The evidence against astrology is as conclusive as anyone could wish (see Carlson 1985; Bok and Jerome 1975), yet it still has its adherents. Why? One reason is that there are some circumstances in which false beliefs can be useful.

The usefulness of false beliefs is illustrated in the following anecdote told by John Masters (1956: 92) to portray the peculiar character of the Gurkhas he served with in India. The story tells of a Gurkha soldier who escaped from a Japanese prison in South Burma and walked 600 miles alone through the jungles of occupied Burma to his base in India. It was a remarkable journey that took six months. Also remarkable was the fact that the Gurkha never asked for directions along the way. He did not speak Burmese, and he did not trust the Burmese anyway. But he never needed to ask directions and never lost his way, because he had a map. He carefully recorded in pencil on the map every river he crossed, every turn he took, and every path he followed. British intelligence was eager to get the map and to know all about the journey. However, the map that had served the Gurkha so well was a disappointment. It was a street map of London.

This story reveals something of the character of the Gurkha. But it also suggests something about structured belief systems in general, and deviant or delusory belief systems in particular. Such belief systems sometimes play the same role in our thinking as the London street map did for the Gurkha. They can help us to structure and make sense of our experience. One reason that astrology still has its devotees is that for some people it is like a London street map: it helps them to find their way through their experiential jungle. And trying to disabuse them of its value may be as futile as an attempt by British Intelligence to disabuse the Gurkha of the value of his map. The map could be given a simple pragmatic justification: it worked!

Less creditable reasons for accepting defective maps are: (*a*) The standard maps are less interesting. (Hume thought that this natural human propensity for credulous belief, which he called the "love of wonder," was responsible for generating a great deal of error.) (*b*) The standard maps are ideologically unsound. (Political or religious preconception may incline one to accept or reject a theory. Thus some people unwisely accept biblical testimony as a reliable authority about the origins of the universe and humankind.) (*c*) Any map is as good as any other map. (This sort of extreme epistemic permissiveness appears to be based on the extraordinary belief that theories do not need to be circumscribed by evidential constraints.)

"However we characterize the scientific method . . . the defenders of psi usually claim that the currently accepted methods of inquiry are too limited."

Coming to appreciate the utility of defective maps in particular circumstances requires understanding not just the *content* of paranormal claims, but also the *structure* of paranormal

"There is a fuzzy, and shifting, boundary between epistemologically disreputable fields of inquiry . . . and the most impeccably respectable."

belief. The powerful urge to accept what seem to be (and often are) outrageous empirical claims is not always the result of some incomprehensible perversity. *It is actually a pathological expression of the very same capacities that enable us to develop some of our most important and profound insights about the world.*

Psychics and other "credulists" are typically engaged seriously (but misguidedly) in that most characteristic of human enterprises: the attempt to capture our chaotic and fragmentary experiences in a network of meanings and to discover the hidden connectedness that (we hope) underlies all the disorderly and recalcitrant happenings in the world. As Stephen Hawking (1988: 13) has expressed it, "Ever since the dawn of civilization, people have not been content to see events as unconnected and inexplicable. They have craved an understanding of the underlying order in the world." Despite the conspicuous difference in approach, the belief structure of psychics has something in common with scientific worldviews. This is the urge to discover (or, failing that, to invent) repetitive patterns that lie hidden beneath a veneer of disorder. Like the scientifically minded, credulists are in pursuit of unifying invariant principles.

A central article of faith that many psychics hold in common is the belief that *there are no real coincidences or accidents.* An accident or mishap is always a superficial appearance, a product of our ignorance, that they believe can be explained as a manifestation of some hidden underlying order (astrological, numerological, or whatever). Beneath the chaotic appearances there is an underlying unity, a hidden order or deeper meaning, that (they believe) some psychic Rosetta Stone will uncover. Yet it is precisely the same assumption—faith in underlying order despite appearances to the contrary—that has motivated many of our most powerful theoretical innovations.

Astrology and other spurious belief systems share with science a distaste for disorder, an urge to find a hidden underlying connectedness linking disparate events. It is the same pattern-making assumption that has enabled us to develop our subtle and profound understanding of the nature of our world. What, then, distinguishes systematic inquiry in respectable disciplines (like physics) from claims of discredited fields (like phrenology)? Spurious belief systems, unlike genuine science, systematically insulate themselves from criticism, and hence from progress. For further explication and defense of this proposal see Chalmers (1982).

Paranormal phenomena are usually at odds with the general run of experience and typically conflict with well-established laws of nature. The violation of a law of nature is one definition of a miracle, and in Part 2 of this article I will go on to examine Hume's discussion of the miraculous. Although Hume's essay was written more than two centuries ago, it provides timely advice for evaluating psi and comparable anomalous claims. Indeed, Hume's principles are helpful for any situation in which we have to decide what to believe when confronted with conflicting testimony.

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Distinguishing the External and Internal Worlds

From the work of the Swiss psychologist Jean Piaget, we know that human beings have a fundamentally egocentric conception of the world. Growing up in modern society means learning to accept the existence of an external world separate from oneself. It is hard. Most of humankind, for most of its history, never learned to distinguish the internal world of thoughts and feelings from the external world of objects and events. Each individual was indivisibly connected to the natural and supernatural powers that govern the world. Cutting this connection, which is necessary before science can develop, goes against the grain of human nature. . . .

Our working hypothesis is that the antecedents of science either permeate a culture or are absent altogether. This follows from the Piagetian view that concepts build in stages. A culture that eventually developed science must have included, in its prescientific era, a number of activities that taught the mind to differentiate between internal thought and external reality. A culture that never developed science won't contain such activities: indeed, all its activities will perpetuate the confusion of thought and reality.

—Alan Cromer, *Uncommon Sense: The Heretical Nature of Science* (Oxford University Press, 1993)

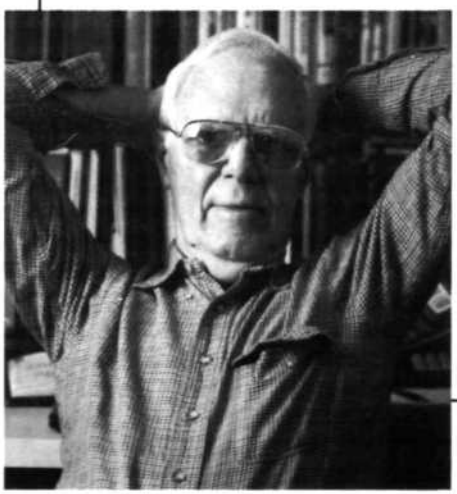
"Crank science books far outsell most books by reputable scientists."

I wrote the words above way back in 1981, in my book *Science: Good, Bad and Bogus.* I think they are still true.

The book is a collection of essays, many of them culled from the pages of the SKEPTICAL INQUIRER. There I dealt with ESP, biorhythms, psychics, and dozens of other fringe-science phenomena.

That was then. This is now. Hardly anyone takes biorhythms, ancient astronauts, or the Bermuda Triangle seriously anymore. I expect that this is at least partly because the SKEPTICAL INQUIRER and its parent, CSICOP, have been doing their work.

Psychics? We have lots more to do there. But we need to work from a position of strength. That's where the Center for Inquiry comes in. The Center, in Amherst, New York (a suburb of Buffalo, 60 miles from Rochester, 80 miles from Toronto, an hour by air from New York City, five hours from California), will be able to dedicate these fea-



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Martin Gardner

Electromagnetic Field Cancer Scares

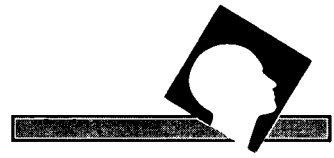
SID DEUTSCH

Do electromagnetic fields cause cancer? Those who claim that they *do* cause cancer seek a scientific explanation for the phenomenon. In this sense, it is not a paranormal claim, but it is a "fringe science" claim and is therefore a valid subject for the SKEPTICAL INQUIRER.

A single example illustrates the importance of the subject (Fischetti 1993). In the United States, in 1993, 17,500 of us will develop brain cancer (according to the National Cancer Institute). About one out of 50 people use handheld cellular telephones. Statistically, therefore, 350 of the people who use these telephones will develop brain cancer. It is reasonable to estimate that 10 of these tumors will occur on the side of the head near where the telephone is held.

On January 21, 1993, David Reynard of St. Petersburg, Florida, blamed his wife's use of a handheld cellular telephone for her death due to brain cancer. The media, ever eager to protect hapless citizens, exposed this hitherto unknown cause of cancer. In a few days, cellular-phone stock prices dropped by 17 percent, and the Cellular Telecommunication Industry Association has pledged to spend $15 million to $25 million in the next three to five years to study the issue.

A great deal of research has been, and will be, done to determine safe limits of electromagnetic energy. I was personally involved in a project some 30 years ago in which the eyes of anesthetized rabbits were held against the open end of a microwave waveguide. Not surprisingly, when the microwave energy was sufficient to cause a sustained temperature rise to abnormal levels, the eyes were damaged (Rosenthal 1976). This, incidentally, illustrates



Despite the media hype, no study has demonstrated a cause-and-effect link between electromagnetic fields and cancer.

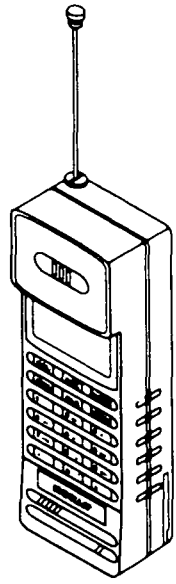
one of the boundary conditions: If incident energy induces an appreciable temperature rise anywhere in the body, it is potentially dangerous. This is, of course, the microwave-oven effect. Bear in mind, however, that a 7°F fever is one of the body's normal defense mechanisms.

It happens that it is a relatively simple procedure to calculate and measure temperature rise in tissue. If it were only a matter of an artificial fever, however, there would be no controversy. The problem is that the David Reynards and their lawyers and many in the media maintain that cancer is *somehow* caused or aggravated by electromagnetic energy that is below the level of appreciable temperature rise. Fringe science resides in the word "somehow."

To meet the electromagnetic field challenge, the Institute of Electrical and Electronics Engineers (IEEE) called upon an interdisciplinary group of 125 people—biomedical engineers, biophysicists, and cancer researchers. After eight years of deliberation, they produced a safety standard known as C95.1-1991.

To cause cancer, a DNA molecule anywhere in the body has to be damaged to the extent that its cell and its progeny grow uncontrollably (and the immune system fails to recognize and eliminate the mutation). Electromagnetic fields *can* harm technicians, who are constantly warned and trained to avoid injury when employed in a high-field environment. For the general public, however, the IEEE C95.1 standard sets limits within which electromagnetic fields are so weak that there is negligible danger of DNA damage.

The danger depends upon how fast the fields are changing; namely, the frequency. The power-station frequency in the United States is, of course, 60 cycles/second (60 Hz). It may seem as if 60 complete reversals in a second is fast, but this is actually extremely slow for an electromagnetic field. There are special problems here, so we will postpone consideration of the power-frequency cancer scare until the end of this discussion.



To begin with, one must separate electric field effects from magnetic field effects—they are different. First, consider the electric field:

The electric field is based upon voltage. We all know that a 1.5-volt flashlight battery, or even a 12-volt automobile battery, is harmless, but the 117-volt outlet is dangerous. (I was once momentarily knocked unconscious when my forehead touched a 117-volt electrode while I was sitting on a grounded pipe.)

At low frequencies, the IEEE limit is 600 volts/meter (600 V/m). (The actual figure is 614, but I am rounding off some of the values.) In other words, in air, across a distance of one centimeter it is safe to have a voltage difference of 6 volts. But the body is no stranger to electric fields—across a typical excitable cell membrane, the field is 10,000,000 V/m! (Deutsch and Deutsch 1993). This is the voltage that sustains the nervous system; students are always shocked to learn these facts of life. Ten million volts/meter is probably sufficient to rip apart a DNA molecule, but the DNA is inside the cell, a safe distance away from the cell membrane.

A 6-foot-tall person is 1.8 meters high, so the IEEE standard allows 1,100 volts across 1.8 meters (caused by the field from an overhead wire,

say). This has to be properly interpreted. It is the field *before* you walk into it. Walk in with bare feet touching the ground, and the head-to-toe voltage becomes—zero! Your body is a relatively good conductor, but air is an insulator, so no current can flow from the wire through the air and from head to toe (although your hair may stand up a bit).

The situation changes if the voltage is alternating, because current can then oscillate back and forth through the body from head to toe, toe to head, and so forth, in synchronism with the electric field, even though no current actually enters the body through the air insulator. The IEEE limits are accordingly gradually lowered. At 30 million cycles/second (30 MHz) and above, the safe limit is 27 V/m. This is the limit for Citizens Band radio (30 MHz) and cordless telephones (50 MHz). The fields generated by these devices are less than 27 V/m.

Above 100 MHz, it is more convenient to deal with the combined electric and magnetic fields. We will look at this later on; for now, consider the low-frequency magnetic field:

We are of course immersed in the earth's magnetic field, and all of us are acquainted with the small rectangular parallelepiped magnets that hold promissory notes against the refrigerator. The body, however, is almost completely nonmagnetic. I (and many others) routinely use an air transformer to feed appreciable amounts of magnetic energy across the skin, from an outside coil to a coil completely implanted under the skin. Moving a hand in and out of the coils has no effect.

At low frequencies, the IEEE limit for magnetic-field testing is 160 ampere-turns/meter. (For example, a one-meter-long 160-turn coil wrapped around your leg, say, can carry 1 ampere.) Changes in a magnetic field, however, induce voltage in the surrounding tissues that can result in dangerous currents. The higher the frequency, the greater the induced voltage. Above 0.1 MHz, the IEEE magnetic-field limit accordingly becomes more stringent decreasing gradually until, at 100 MHz, it is only 0.07 ampere-turn/meter. The magnetic fields produced by Citizens Band and cordless telephone transmitters are, of course, below the IEEE limits at their respective frequencies.

What happens at very high frequencies, such as at 100 MHz and above? Now the length of a wave is relatively small. It is best to think of the electromagnetic field leaving the antenna (which is also relatively small) as a beam, such as the beam of a flashlight. At these very high frequencies, when the beam strikes your body, it is almost completely reflected in the same way that a beam of light is reflected from a mirror.

The IEEE safe limit is now expressed as the power density in the "beam." At 300 MHz, it is 2 watts/square meter (2 W/m^2). It should be easy to visualize this power density: You know how much heat is given off by a 100-watt lamp. Now imagine that this heat is evenly distributed over the front of your body, which has an area of around 0.5 square meter, say, so that the density is 200 W/m^2. Next, imagine that this slight warmth from the 100-watt lamp is diluted by a factor of 100; this gives us the IEEE limit of 2 W/m^2. Finally, divide by another factor of 10, say, to account for the signal reflected from the body, to get an idea of the minuscule amount of heat absorbed at 300 MHz.

Another way of looking at the safe level is this: 2 W/m^2 is equal to 0.0002 watts/square centimeter or, after allowing for reflection, some 0.00002 W/cm^2. This is far below the level at which an appreciable temperature rise

can occur (or, we maintain, the level that can cause a DNA molecule to mutate).

A further surprise awaits us: Reflection from the body improves as the frequency increases, so the safe limit *increases*. Above 300 MHz, the IEEE power-density limit accordingly increases gradually until, at 15,000 MHz, it is 100 W/m^2. Along the way we have cellular telephones at around 800 MHz (safe limit 5 W/m^2); microwave ovens at 2,400 MHz (safe limit *outside* the oven is 16 W/m^2); and police radars above 15,000 MHz (safe limit 100 W/m^2). In all of these applications, the energy entering the body is minuscule.

Let us now consider the cancer scare at the power-station frequency of 60 Hz. People have been rightfully concerned about this for many years: We are exposed to 60-Hz fields from overhead power lines, house wiring, electric blankets, etc., and cancer is near the top of the list as a cause of death. Given our modern lifestyles, is there a link between the 60-Hz fields and cancer? To answer the question, we perform controlled experiments using cells and tissue grown in culture; animal experiments; and epidemiological surveys of people who live near power lines. The result of a large amount of research money spent over many years is, alas, a shouting match involving plaintiffs, defendants, and their lawyers (and even a few scientists). We are exposed to so many carcinogenic agents (natural radioactivity from radon and manmade pollutants from automobiles, to name two) that it is impossible to prove that John Smith's cancer was caused by power-frequency fields.

In our decade of need we turn to the IEEE, which, according to its unabbreviated title, is responsible for effects accompanying power-station frequencies. The C95.1 standard does not go below 3,000 Hz. For 60 Hz, the IEEE advocates further research. Its United States Activities Board issues Entity Position Statements (EPSs). The EPS pertinent to the present discussion states, in its introduction: "Although prior studies have not indicated a health hazard in power frequency electric and magnetic fields, there continues to be widespread public concern. This paper is intended to identify research needs to provide acceptable answers. It does not attempt to identify where that research will be conducted, nor how it will be funded." This is followed by an analysis that includes research suggestions.

In the meantime, since this appears to be an ongoing controversy, what should be the commonsense position of skeptical scientists? The IEEE low-frequency magnetic-field limit of 160 ampere-turns/meter corresponds to a flux density of 200 microteslas (200 μT). The earth's magnetic field has a strength of about 50 μT. Nobody has suggested that the earth's field causes cancer, and neither is it reasonable to propose that a 200 μT field should be viewed with suspicion. According to the above-mentioned EPS, chronic exposure in the home is generally below 1 μT; more intermittent, but not uncommon, exposure near transmission lines rarely exceeds 10 μT. (I would add that the field of a refrigerator bar magnet can be far greater than 200 μT).

The IEEE low-frequency electric-field limit of 600 V/m *outside* the body is far below the level at which a DNA molecule *inside* the body will sustain damage. The EPS referred to above states that chronic exposure in the home is generally below 10 V/m; exposure near electric appliances or electric transmission and distribution lines can exceed 5,000 V/m on rare occasions, but these are *intermittent* occurrences.

It remains to be seen if judges and juries will respect the scientific evidence represented by the IEEE C95.1-1991 levels, or if they will bow to the emotional appeal of a dying cancer patient who held a cellular telephone near the side of her head. The cost to society of unnecessarily scaling back electric, magnetic, and power levels is enormous, both for past and future equipment. An increase in the gasoline tax would accomplish much more by way of cancer prevention. We have to be engaged in a never-ending battle to raise the technical sophistication of those who are born into this technological world.

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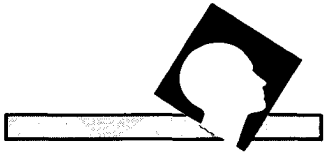
The Attacks on Role-Playing Games

PAUL CARDWELL, JR.

Television productions, particularly made-for-TV movies, are a popular source of paranormal claims. These are especially troublesome when they claim to be documentaries, since the producers and networks frequently retreat behind a defense of "entertainment" when challenged. One of the long-time favorite subjects has been role-playing games—almost exclusively Dungeons & Dragons, which is a trademark of TSR, Inc., but often misused as a generic term.



While diminishing in frequency, attacks on role-playing games are still popular with the mass media.

These games are not only among the favorite topics of TV movies. The Associated Press and United Press International, between 1979 and 1992, carried 111 stories mentioning role-playing games. Almost all named only Dungeons & Dragons, even though there are several hundred such games on the market, and among their manufacturers are more than a dozen companies beyond the desktop publishing level. These articles contained 51,182 words in 2,197 paragraphs.

These paragraphs were divided into four categories: those favorable to gaming, those unfavorable to gaming, those neutral (stating they existed, describing them accurately, but without value judgments, etc.), and those paragraphs not mentioning them at all, even by inference. Those in the last category were discarded. Based on the remaining paragraphs, each story was tabulated as having a majority of pro-game paragraphs, anti-game paragraphs, neutral paragraphs, or with no category having a majority. Of the 111 stories, 80 were anti-game, 19 had no majority, 9 were neutral, and only 3 were pro-game. Those three pro-game stories were all from UPI, which is a considerably smaller wire service than AP.

"The collection of anti-game anecdotes has sometimes been called a 'modern urban legend,' a term coined by the folklorist Jan Harold Brunvand. Actually it is a collective delusion."

Dungeons & Dragons was first marketed in 1972 as a supplement to the miniatures wargame system *Chainmail*. The D&D rules as a separate system were published in 1974. The game grew rapidly from a very small base, doubling sales each year primarily through word-of-mouth advertising (Gygax 1989). This occurred mostly on college campuses, which became its natural environment. During the late 1970s, several other role-playing games entered the market too.

The first attacks on role-playing games (RPGs) came in August 1979, during the disappearance of Dallas Egbert III from the Michigan State University campus just before exams. The campus police could not find him, and since all evidence indicated that he left the campus voluntarily, their jurisdiction was limited. Egbert's uncle then hired private detective William Dear, and the nature of RPG changed forever.

Egbert was a troubled kid. In 1979, according to Dear's book, *The Dungeon Master*, he was a sophomore in college at 16, with a 180 IQ, socially retarded (Dear 1985: 20-21), an epileptic not quite under medical control (pp. 88-89), a drug addict (p. 163) who claimed to make his own drugs (pp. 17, 22), and under severe pressure from his mother to make perfect grades, even though he had no difficulty making good ones (pp. 20-21, 316). Also, since Egbert was a homosexual (p. 316), the homophobia on campus in 1979 undoubtedly was a contributing factor to the stress that caused him to vanish. I am not comfortable relying only on Dear for all of this information, but since the Egbert family will not help, I must assume that either they are not interested in correcting the record or that Dear is essentially correct in his statements.

Dear came onto campus and from fragmentary tales, second- and third-hand, or worse, he pieced together the story that has become a cliché: Egbert, generally described as a "computer genius"—an exotic title at that time—was also involved in an even more exotic activity. He was playing the "strange" game of Dungeons & Dragons in the steam tunnels under the Michigan State campus (pp. 31-32), a statement denied by Dear's publisher in the acknowledgments and on page 13. In this story, Dear confused three separate and unconnected things.

First, almost every college has steam tunnels and steam-tunnel stories. Yet access to these tunnels virtually always involves at the least the crime of breaking and entering. MSU at that time was something of an exception in that access to the tunnel system could be gained through buildings under construction—still trespassing, but a lesser crime (Flinn 1988). The tunnels are cramped, hot, humid, and dirty. They are hardly an easy way to get from one building to another, as many students believe. Indeed, even if one had the proper keys to make the trip, one would look a mess upon arrival. One can get scalded from valving steam, and getting lost is a distinct possibility. It is a combination of the forbidden territory and real danger that makes this a modern urban legend on campus.

TRS Inc.

Second, RPGs are played sitting around a table and improvising adventure tales (in a wide variety of genre, although classic fantasy is the most popular) within the constraints of a set of rules. It is played with pencil, paper, and an assortment of various-sided dice, which serve as random-number generators. The math field of probability is a major factor in playing these games. Everything is described, and nothing is acted out. This is quite contrary to the common impression generated by Dear and spread by credulous mass media.

Finally, there is the Society for Creative Anachronism, which was started in 1966 and recreates a fictional sort of medieval life of fairy-tale legend. The members get some media attention for their jousts, but their equally exotic costumes, lute-playing, juggling, and such, which typify the popular concept of the late medieval and early Renaissance, are largely ignored.

Dear, putting parts of all of these folktales and campus rumors together, came up with the hypothesis that Egbert was lost in the steam tunnels, where he had gone to play D&D with his fake broadsword. Never mind that a steam tunnel is too small a place to swing a fake broadsword, that D&D is played indoors, and that fake broadswords belong to a wholly different context. This was Dear's hypothesis and he promoted it at numerous press conferences.

There was another flaw in Dear's hypothesis. Neither Dear's crew nor the campus police found any game material in Egbert's room, even though he disappeared with only the clothes he was wearing. Nor could they find anyone on campus who had ever played a game with him (Dear 1985: 80). Egbert did subscribe to *Dragon*, the official D&D magazine, and had at least once registered at a gaming convention sponsored by TSR, GenCon (Kask 1979: 2, 11); although there is no real evidence he actually played, it can be assumed he played at least some. Certainly he was not deeply involved in the game.

Egbert eventually "found" himself about a month later—in Morgan City, Louisiana, claiming to be an oilfield roughneck (Dear 1985: 324). Since at 16 Egbert looked about 12, this does not ring true; but then very little else

about the Egbert case does either.

While the reputation of RPG never quite recovered from this media circus, things were a bit quieter for about four years. TSR's sales did not double that year—they *quadrupled* (Gygax 1989: 13). TSR seemed to think that this proved that bad publicity was good publicity, and it rarely defends its game. Other industry watchers point out that at this time TSR entered into a distribution agreement with Random House, and this just might have had some positive effect on sales.

Then came the second event that would permanently imbue RPGs with the same aura that haunts so many of the subjects examined in this publication. Another 16-year-old super-genius, this one still with his own age-group, committed suicide. This was Irving (Bink) Pulling II. He had actually played D&D as a part of the gifted/talented program at school. However, he was as troubled as Egbert. A nominal Jew, he was apparently a fan of Adolf Hitler (Bauerlein 1988). He got up one night and killed 17 rabbits and a neighborhood cat for no apparent reason. He was socially isolated, once failing to get even a proforma "campaign manager" to sign on for him when he wanted to run for school office (Isakoff 1983).

"In the late eighties, there was another change in emphasis. The games now were said to cause murder."

Yet his mother, Patricia Pulling, described him as "a happy, well-adjusted kid" and blamed D&D when he committed suicide with her pistol. She also claims receiving ESP knowledge of the event upon reaching the gates of their house (Pulling 1989: 4).

The suicide mechanism, she claims, was a curse placed on Bink's game character during a school game. She claims that this curse compelled him to kill and that he heroically sacrificed himself rather than carry out the curse. Classmates present at the time of this supposed curse deny there was any such event (Picton 1985). The attackers consistently confuse player and character and try to make them the same thing.

Pat Pulling then embarked on a decade of lectures attacking the game. She has only recently abandoned this tactic. She sued the school for Bink's death, only to have the suit quashed (*Pulling v. Bracey*, 1984). She teamed up with the National Coalition on Television Violence (NCTV), essentially a one-person organization headed by Illinois psychiatrist Thomas Radecki, and ultimately became a director at NCTV. Pulling also created her own organization, Bothered About Dungeons and Dragons (B.A.D.D.).

In January 1985, B.A.D.D. and NCTV jointly filed a petition with the Federal Trade Commission demanding that warning labels be required on the games, stating that they were hazardous and could cause suicide. The FTC forwarded the petition to the Consumer Products Safety Commission because the petition alleged an unsafe product rather than fraudulent advertising. The CPSC finally decided that there was not a close enough connection between the product and the alleged danger to warrant such labeling.

The list of "victims" submitted with this petition became the basis of ongoing compilation. The petition had nine cases, one of which gave no name, date, place, or documenting citation. Another was an accident, not a suicide as stated. Three were children of

members of Pulling's B.A.D.D. group for whom Pulling's simplistic explanation may have been a means of their avoiding facing the deaths of their children. This is not a universal reaction. Three other cases were disputed by the parents of the victims, who claimed that the games had nothing to do with the deaths (AP 1985; Grice 1985).

NCTV and B.A.D.D. claim that 120 such cases implicate role-playing games; this figure remained unchanged from 1987 until Radecki upped it to 128 in March 1993 (Gil Gross Show 1993). During that time of stasis, they still added "cases" to the list. They provide names, dates, and/or places (rarely all three) in fewer than 25 of these. Of those few, one has never been found in any documentary account, and another was from an item in a newspaper from a town more than 250 miles from the alleged event, but no newspaper coverage could be found in the city in which it supposedly happened. In the few cases of citations, they are almost always in relatively obscure, small-town newspapers that, when they are finally located, turn out to be based on statements from anti-game individuals. The alleged dangers of playing these games have been treated by newspapers and TV talk shows as fact, as so often happens with claims of flying saucers, the Bermuda Triangle, livestock mutilations, satanic sacrifices, and all kinds of other horror stories.

The collection of anti-game anecdotes has sometimes been called a "modern urban legend," a term coined by the folklorist Jan Harold Brunvand. Actually, it is a collective delusion. The modern urban legend is a traveling tale, in which the same story is set in various parts of the country and has "actually happened" to a friend of a friend, with only the names of the people and places changing. A collective delusion, on the other hand, is seen to be a situation that is "everywhere" but "they" are keeping it a secret. Thus the attacks on role-playing games are part of a phenomenon that Brunvand calls "satanic panic."

The attacks have gone through several stages. In the early 1980s, much was made of gamers', particularly younger ones, "casting hexes" on teachers and parents. Aside from assuming the magic in the games was not only real but translatable into real life, there was another assumption: that the game was teaching this real magic.

Fortunately, I was actually able to observe one of these cases in 1984. A junior high school let those students arriving early go to the lunchroom to escape the bad weather while waiting for school to start. Four students played D&D while waiting and as a result were verbally attacked and ultimately denounced before the school as "Satanists" by one of the teachers.

Two of the students were active members of mainline Protestant denominations, one was a rather nominal Roman Catholic, and the fourth was an extremely devout member of a fundamentalist sect. He

moved shortly after the episode and attended a fundamentalist parochial high school that had no difficulty accepting role-playing games.

An additional problem for the school was that the parents of one of the students were both law-enforcement professionals. They conducted an investigation of the episode that totally verified the students' story. The teacher made an insincere apology, and the school principal promised it wouldn't happen again. However, the game is still banned from the before-school free time, and the teacher was given a merit raise at the end of that year.

The kids found it more amusing than traumatic. Mocking the credulity of the teacher, they would make weird gestures when they met him in the halls. This ridicule, I contend, is what was really going on in the "hexing" stories.

With the FTC petition, the emphasis changed from magic to suicide. After all, magic is rather hard to prove, while suicides are a matter of public record.

There are more than 5,300 suicides a year in the United States in the 15-to-24-year-old age group (National Safety Council 1988), which in the mid-1980s provided most of the gamers. The average age is climbing, and the average age of the serious players may well be even higher. Therefore, to have no connection whatsoever, there would have had to have been at least 1,060 gamer suicides per year. Yet, in the whole time since 1979, there have been only 128 claimed game-related suicides, murders, robberies, rapes, etc., combined, and Radecki claims only one-quarter (64) are suicides (Gil Gross Show 1993). The statistics are actually arguing that gaming prevents suicides rather than causing them.

Of course it does neither. Role-playing gaming requires imaginative solutions to complex problems. Therefore it attracts those who have some degree of skill in doing just that. These people can generally do the same in real life and thus avoid using "a permanent solution to a temporary problem," which suicide usually is. Again, the game-bashers have their cause and effect reversed.

In the late eighties, there was another change in emphasis. The games now were said to cause murder. Again some post hoc ergo propter hoc "case histories" were brought out, and again they were disproved on examination.

The final change occurred around 1990. Building on the regular appearance on tabloid TV shows of multiple-personality syndrome cases in which persons claimed to have been the victims of ritual satanic cult abuse, the anti-game campaign came almost full circle. Critics now claimed that RPG was the same as Satan worship.

However, this time the anti-gamers went just a little too far into the spooky area for many followers outside the groups that provide the foundation for the anti-game movement itself. It is true that they have had some success in "cult-awareness seminars," which are closed to any dissenting viewpoints and are used to indoctrinate teachers, social workers, and police. But this initial anti-gamer success is slowly being countered by gamer backlash and the beginning of skepticism in the general public. Even the mass media have been neglecting such charges of late.

This skepticism is due to several factors. First is common logic. With so much evil in the world, obvious just by turning on the TV news programs, these games pale into insignificance. Some 7.5 million play these games at least once a month (Buettell 1990), mostly in the U.S. and Canada, with

sizable numbers in Britain and Australia, and smaller but quickly growing activity in Scandinavia (including the Baltic republics), France, New Zealand, and Brazil. While this is a small number in percentages, it means that most of the people these attacks are aimed at convincing—the upper-lower- to upper-middle-class white, religious suburbanites—personally know quite a few persons who play these games, and they notice the charges are definitely not true for these friends and acquaintances. Therefore, they tend to question the validity of the same charges against people they don't know.

Second, in 1988, a couple of gamers who had been corresponding after meeting at a game convention decided it was time to organize in defense of gamers. This was the start of the Committee for the Advancement of Role-Playing Games (CAR-PGa). What William Flatt and Pierre Savoie started has slowly grown since, although more in quality than in numbers. After several years of comparative silence, the Game Manufacturers Association is again taking a stand on the issue.

When CAR-PGa was first organized, it was assumed that at least some of the stories must be true, and that the group would find what the variable was, change that, and make the games completely safe. After several years of searching the literature, it became obvious that we were dealing with a colossally successful "big lie," supported by the mass media's ignoring any opposing views. How the anti-game groups gained such influence over a generally anti-censorship mass media is yet to be discovered and any such evidence would be greatly appreciated. To be sure, horror stories sell papers and attract audiences, but controversy does so even more. Nevertheless, all controversy was kept

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Thoughtful.

Curious.

Concerned.

. . . That's a good description of our readers and . . .

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out of the media; only the anti-game side was presented.

There was a final factor that undermined the anti-game forces. During the first years of NCTV, Thomas Radecki claimed to be on the faculty of the University of Illinois (Champaign-Urbana) medical school. When I checked the school, I found that he had never been on the faculty. Although at one time he had been given the honorary "clinical faculty" status—given to doctors who are accredited to practice at a teaching hospital and not involving any faculty duties, except for the answering of occasional questions asked by medical students—this was pulled in 1985 (O'Morchoe 1988), long before he stopped claiming faculty status in promoting NCTV.

In March 1992, Radecki quit NCTV and turned it over to a Beverly Hills colleague, Carole Lieberman.

The faltering campaign against RPG was given a boost during the 1992 "May sweeps" for TV audience ratings. On the first day of sweeps and again on May 17 and 19, two heavily hyped TV movies were shown based on the murder of Leith Von Stein, in Washington, North Carolina, in 1988. While the first was a turkey, the second, *Cruel Doubt*, was better acted, if just as hokey, and returned to network broadcast in August 1993, right after extensive play of the admittedly fictional *Mazes and Monsters* movie.

In the Von Stein case, a boy arranged for two friends to kill his parents. The stepfather was killed and the mother survived. A $2-million inheritance was barely mentioned, as though it couldn't possibly have been a motive. Both movies, and the books they were based on, had a "smoking gun," a game scenario describing the murder. The problem is that no such scenario was found after exhaustive searches by CAR-PGa and the university-based computer bulletin board, UseNet.

Yet, since these books were published, there have been two more cases copying the Von Stein modus operandi explicitly. In the first, the British Columbia Huenemann/Leatherbarrow case, a boy arranged for friends to kill his mother and grandmother, both successfully, for a $3-million inheritance (Mullins 1992). In the second, the Koslow case in Texas, the daughter arranged it for a $12-million inheritance. The stepmother was killed, and the father survived his injuries, but games were never mentioned (Crawford 1993). However, in neither of these cases, were the two "true crime" books investigated as a blueprint—but in the Von Stein case a nonexistent game scenario was blamed.

It is still too early to tell what effect these programs will have on public opinion. The original broadcast of *Cruel Doubt* was opposite a show hyping flying-saucer abduction stories. One can assume that these incredible beliefs will never die out, but will live on in the minds of a credulous minority, be tolerated by an apathetic majority, and to the rest of us sometimes be a source of persecution and always be a source of irritation.

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Science Without Solemnity

. . . [Francis] Crick set the tone with a talk of the kind [in] which he specializes: not a wasted word. . . . The talk was deft, as deft as a double helix with the strands running in opposing directions. What was it like then? No rushing to the lab. No secretaries, but no mail to speak of either. No traveling except perhaps to Paris. No trans-Atlantic telephone. Hardly any literature to read. And no keys to the lab at night (so that people had to climb the railings if they wanted to work then). Much was done in pubs. . . . Crick's purpose—but he is too much a gentleman to have declared it—may have been dangerously nostalgic: to demonstrate by example that it is possible to do good science without being solemn, even that science can be good fun. He laughed a lot, mostly at himself.

—John Maddox, in "Watson, Crick, and the Future of DNA," writing about the fortieth anniversary celebration of the discovery of the structure of DNA, in *Nature*, March 11, 1993.

Global Fortune-Telling And Bible Prophecy

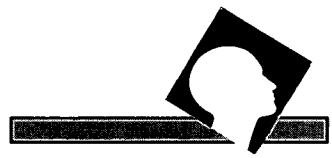
TERRY TREMAINE

We are accustomed to think of fortune-telling as directed toward individuals. Astrology, Tarot cards, palmistry, and crystal-gazing are well-known examples. When prediction is applied to a larger group, such as a community, a nation, or the world, we are inclined to refer to it as prophecy. Examples include the more general predictions of psychics, astrologers, and futurists inclined to paranormal methods, as well as the prophecies of Nostradamus and the Bible.

Many people believe in apocalyptic divine intervention as a remedy for the world's problems. Most, if not all, fundamentalist and evangelical Christian sects hold such beliefs. (I would include in the fundamentalist camp anyone who holds to the belief that the Bible is supernaturally inspired and inerrant.) Furthermore, religious sects whose teachings are often shaped by their views on Biblical prophecy are proliferating in various parts of the world.

The Branch Davidian cult in Waco, Texas, is a tragic example. It appears that members of this group regarded themselves as representives of the "kingdom of God" on earth, with David Koresh as their messiah. They apparently saw themselves as representing a new world in opposition to the existing world order. The results of their confrontation with the existing power structure are now well known. They based their outlook on prophecies in the Bible, particularly the Book of Revelation. Their activities and beliefs are but one aspect of a more general phenomenon that requires, for philosophical as well as practical reasons, bringing a scientific attitude to bear on this issue.

Prophecies generally fall into one of two categories: precise and capable of falsification (i.e.



Prophecies of apocalyptic doom or of the Second Coming are a time-honored form of global fortune-telling. What happens when you bring a scientific attitude to bear upon them?

stated in such a way that it is capable of being proved false if it is false, a key element of a scientific statement) or general and not falsifiable. The boundary between these two classes is blurred, sometimes because of the imprecision of human language and sometimes for less legitimate reasons. Examples of prophecies that are precise and capable of falsification might include items from the tabloids in which psychics give their predictions for the coming year (see *SI*, Spring 1993, p. 256, for the latest report on their dismal results). If a psychic predicted last year that the Queen of England would abdicate the throne in 1993, this would be a good example of a falsifiable prophecy. If a psychic had predicted in 1985 that the Soviet Union would cease to exist within ten years, this would be another. If, however, a psychic predicted that invisible aliens would land on the opposite side of the moon this year, it would be difficult to confirm or refute.

In the Bible we find a prophecy of the precise and falsifiable sort, where Jesus predicts that his return (the so-called Second Coming) would occur within the lifetime of at least some of his contemporaries. The conditions for its fulfillment were stated clearly: that his return would be seen and acknowledged by the whole world and that it would happen before that generation passed away (Mark 13:14–30). This clearly did not happen and must count as a precise prophecy that was falsified by the passage of time. This fact has been well known since ancient times (2 Peter 3:3-4) and has been voiced by T. H. Huxley (Huxley 1989), Bertrand Russell (Russell 1927), and other thinkers, for whom it was a reason to remain unbelieving, and by the biblical scholar Albert Schweitzer (Schweitzer 1906).

Modern historical criticism has dealt with the possibility that Jesus was not the source of the prophetic sayings attributed to him concerning the end of the age. Such books as *The Historical Jesus*, by J. D. Crossan, and *The Lost Gospel: The Book of Q and Christian Origins*, by Burton Mack, both present this view. Fundamentalists want nothing to do with historical criticism, however, especially if it presents evidence that the Gospels were the product of human contrivance and invention.

In the past few decades, there has been a flood of books concerning the events allegedly preceding the Second Coming of Jesus. These books contend that events we read about in the newspaper and see on television are in fact fulfillments of biblical prophecy. It never seems to occur to these writers that the principal character involved in the Second Coming was himself wrong concerning its timing if not its occurrence (if in fact Jesus was the source of those predictions as fundamentalists themselves believe). The tendency in these books is either to ignore the prophecy of Jesus (which is extremely ironic in itself) or to distort its meaning, for example, to imply that the reference is to the generation *now* alive that would not pass away before his return. This is the tactic adopted by Hal Lindsay, whose books have enjoyed tremendous popularity.

This raises the matter of the blurred boundary between prophecies that are precise and falsifiable and those that are not. Sometimes this blurriness is due to the natural imperfections of human language and the fact that words can have shades of meaning, perhaps even entirely different meanings in different contexts. Other times it is due to the deliberate activity of those with a vested interest in seeing that a prophecy not be falsified. For example, they

change the meaning of words and phrases to accommodate the facts that run contrary to the original prophecy. In other words, they cheat.

This tendency to alter clear meanings within the Bible to preserve its prophecies from falsification ought to remind us of pseudoscientists who rig the game so that cherished (or perhaps profitable) beliefs can never be disproved. When evidence comes to light contrary to their "theories," pseudoscientists are able to show that their theories can accommodate that evidence. They are always able to reinterpret their theories to make them accommodate any new facts.

In the mid-nineteenth century, a man by the name of William Miller, influenced by a solar eclipse in 1780 and a shower of meteors in 1833, came to believe that Jesus' return must be near. As a result of his research into the Book of Daniel, he set the time for the Second Coming as the spring of 1844. The anticipated event did not occur. Miller and his followers concluded that they were wrong in their calculation and then contrived the new date to be October 1844. Again it was a no-show. This time, however, in spite of the disappointment, Miller and the inner core of his followers concluded that they were only partially mistaken. Although Christ had not returned to earth, he had returned to an invisible heavenly sanctuary. His coming to earth then became imminent (Jordan 1988).

More recently, Hal Lindsay (1970) said that Jesus would return before this generation passes away. He originally expressed the view that a biblical generation is actually 40 years and the clock began ticking the day Israel became a nation. The year 1988 has come and gone with Lindsay caught in his error. Fortunately, he anticipated this. In an interview published in *Christianity Today* (April 15, 1977, p. 40) he stated: "I don't know how long a biblical generation is. Perhaps somewhere between sixty and eighty years." If we grant that a more accommodating figure, like 80 years, is the length of a generation, then he would still have until 2028 for his forecast to be realized. Let's be even more daring. Medical science might bring in practical immortality by then, and this generation might be around a long time. In such a case Lindsay might never be proved wrong, a veritable paradise for a pseudoscientist.

Some sects avoid the problem by simply stating that the Second Coming has occurred and their leader is in fact Jesus Christ. This apparently was the ploy used by the Branch Davidian sect in Waco and it has been used throughout history. There were individuals claiming to be Jesus Christ subsequent to the destruction of the Jewish temple by the Romans in A.D. 70 (Mark 13:6 and Crossan 1991).

In 1992, there were predictions that Jesus would return in the autumn (see "Where's the Rapture?" *SI*, Summer 1993, p. 367). This year (1993) there are predictions by the well-known preacher Harold Camping (who appeared on CNN's "Larry King Live," March 8, 1993) that the great day will be in 1994. He has also written a book defending this viewpoint (Camping 1993). He thinks that October is a likely month for the Second Coming and the end of the age. We need not hold our breath. If the fundamentalists are right that the Bible is inerrant, then it accurately records the words of Jesus. In such a case, Jesus would be the source of a prediction that turned out to be wrong. Since Jesus was wrong, he could not have the divine authority the fundamentalists claim for him. So, if the fundamentalists are right, then they are wrong. Therefore they are wrong.

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Tool-Driven Scientific Revolutions

Scientific revolutions are more often driven by new tools than by new concepts. Thomas Kuhn in his famous book, *The Structure of Scientific Revolutions,* talked almost exclusively about concepts and hardly at all about tools. His idea of a scientific revolution is based on a single example, the revolution in the theoretical physics that occurred in the 1920s with the advent of quantum mechanics. This was a prime example of a concept-driven revolution. Kuhn's book was so brilliantly written that it became an instant classic. It misled a whole generation of students and historians of science into believing that all scientific revolutions are concept-driven. The concept-driven revolutions are the ones that attract the most attention and have the greatest impact on the public awareness of science, but in fact they are comparatively rare. In the last five hundred years we have had six major concept-driven revolutions, associated with the names of Copernicus, Newton, Darwin, Maxwell, Einstein and Freud, besides the quantum-mechanical revolution that Kuhn took as his model. During the same period there have been about 20 tool-driven revolutions, not so impressive to the general public but of equal importance to the progress of science.

I will not attempt to make a complete list of tool-driven revolutions. Two prime examples are the Galilean revolution resulting from the use of the telescope in astronomy, and the Crick-Watson revolution resulting from the use of X-ray diffraction to determine the structure of big molecules in biology. The effect of a concept-driven revolution is to explain old things in new ways. The effect of a tool-driven revolution is to discover new things that have to be explained.

—Freeman Dyson, "George Green and Physics," *Physics World,* August 1993

A Chernikov Pattern Puzzle

CLIFFORD A. PICKOVER

Remote viewing generally refers to the alleged ability of some individuals to observe, through paranormal means, an object or drawing hidden from view.

The following describes an experiment I carried out to test the ability of words to describe a graphic diagram. My goal had nothing to do with remote viewing, but I was fascinated by the degree to which initial results could have been improperly construed as evidence for remote-viewing ability. The exercise can easily be carried out by teachers in college and secondary school settings.

Limiting myself to 75 words, I asked people who had never seen this particular design to draw the target picture in Figure 1 from the following description:

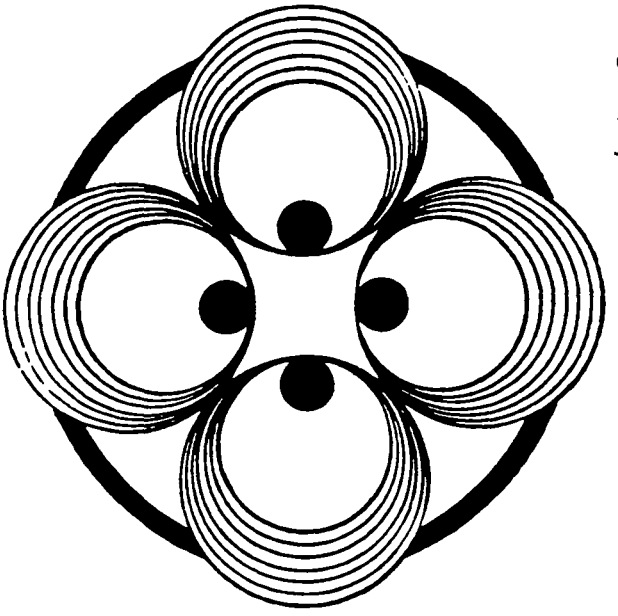
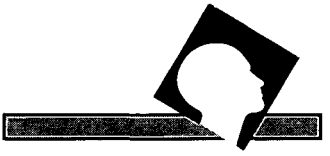


FIGURE 1. The Chernikov target picture, described using 75 words.



Experiments in drawing hidden figures might lead some wrongly to believe in "remote viewing." Try this experiment yourself.

There are four quarter-sized circles arranged so they touch. They are on top of one larger circle with a thick edge, and cover the circle slightly. Inside each of the four circles is a black dot which touches the edge of each of the circles. The four circles also contain six circles inside them. The six circles get smaller and smaller, but all of their edges touch the black dot.

I called the target diagram a "Chernikov pattern," after the Russian mathematician/artist who has catalogued hundreds of simple geometrical designs. In my description I limited myself to nonmathematical terms. The survey was conducted using the electronic computer mail network. Participants included scientists, programmers, and administrators.

Although the short, ambiguous description should not have been sufficient for anyone to accurately reproduce the Chernikov pattern, many colleagues were amazed to see the first design (Figure 2) sent to me, by Robert Guth of San Jose, California. It came incredibly close to the target image. One colleague even said, "It looks like ESP."

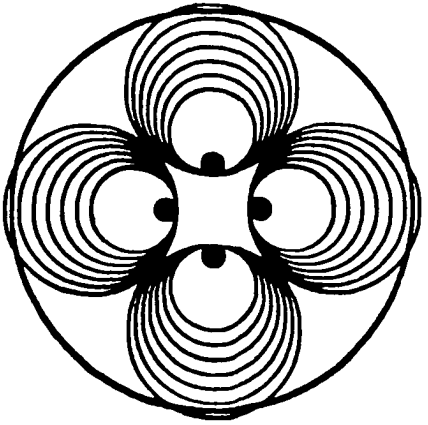


FIGURE 2. Robert Guth's drawing of the target.

However, as I started to compile a collection of figures, it became clear that a better explanation for the uncanny resemblance was that among hundreds of responses I was very likely to get a few that were close to the original target! This became apparent as additional guesses were sent to me. This exercise demonstrates that researchers should be careful not to be misled when initial results appear startling—and they obviously should not stop an experiment prematurely, before a large sample is taken.

I include some of the many drawings I received to show the range of results (Figures 3a and 3b). I reduced the respondents' original diagrams by a uniform amount. Each diagram represents a different respondent's attempt to draw the target according to my description.

This Chernikov-target experiment provides an infinite number of possible future experiments. Here are just a few ideas, and I would be interested in hearing from any readers who have conducted the following tests with the Chernikov figure.

1. How would *different* people describe, using no more than 75 words, the Chernikov target figure in Figure 1? Perhaps some readers could construct much more accurate descriptions that would improve the respondents' diagrams.

2. Create a catalogue of figures using different numbers of words to describe the target figure. For example, what would pictures look like if only a 50-word description were allowed? What would respondents' pictures look like if only 25 words were allowed? What would pictures look like if 500 words were allowed?

3. Conduct an experiment where you take the worst representation (that is, the picture most different from the target), and use this as a *new* target for another experiment. Continue to propagate the error until the first target bears no resemblance to

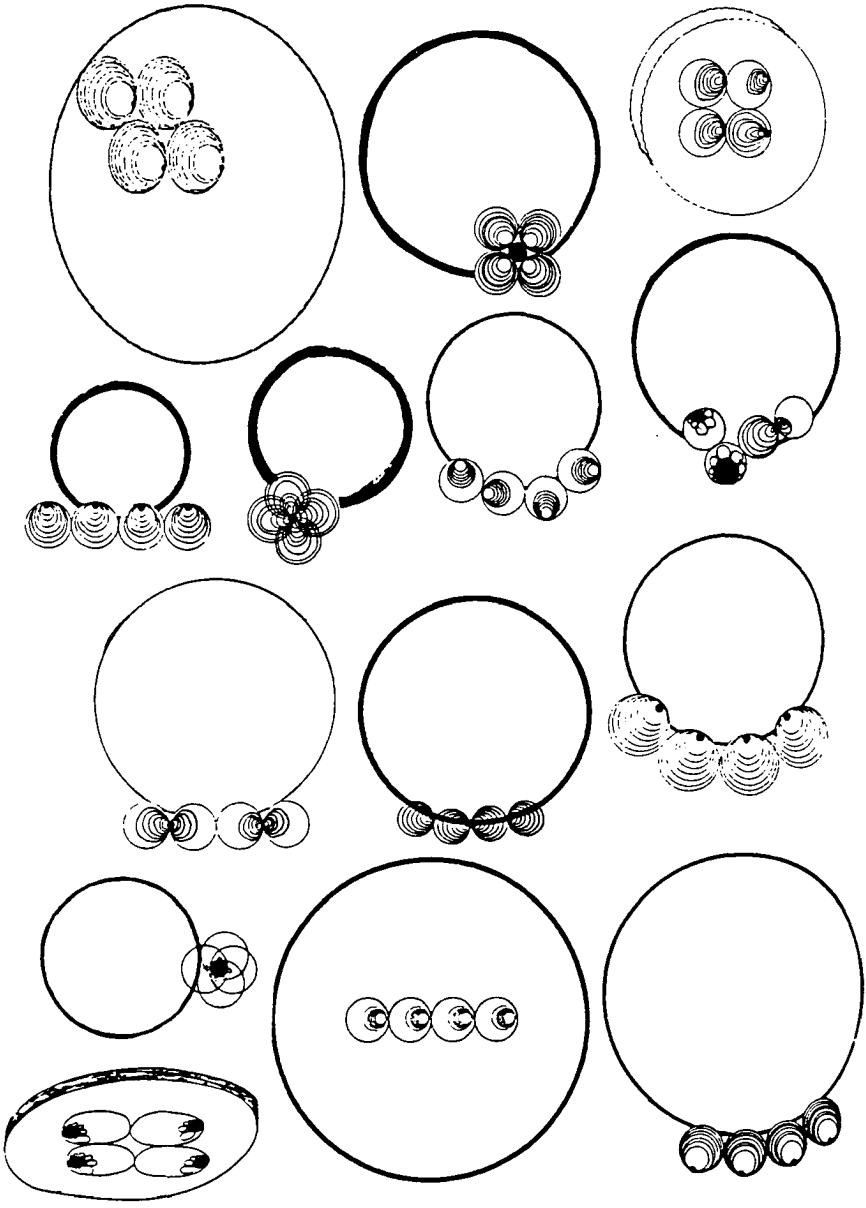


FIGURE 3. A variety of drawings of the target from many different individuals.

the new images. How many generations of selecting the least accurate representation would this require?

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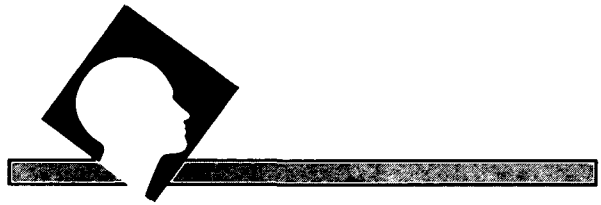
Book Reviews



Constructive Skepticism and Everyday Life

The New Skepticism: Inquiry and Reliable Knowledge. By Paul Kurtz. Prometheus Books, Buffalo, N.Y. 1992. 371 pp. Hardcover, $24.95.

JOHN M. NOVAK

At a time when a tabloid headline proudly announces "Hillary Clinton Adopts an Alien Baby" while also providing an official photograph, and when a cultish control of lives results in the fiery immolation of scores in Waco, and when more and more people find it too easy or, ironically, too difficult to believe anything, there is an urgent need to reassert the necessity to live life affirmatively, guided by a sensitive, critical intelligence. But where are we to turn for such a perspective? According to Paul Kurtz, a reconstructed skepticism provides the attitudinal and methodological fulcrum to lift us out of our existential knowledge crisis. But what is this "reconstructed skepticism" and what is new and constructive about it?

According to Kurtz, the new skepticism is about inquiry and reliable knowledge, two vital areas of life that have been decimated by dogmatisms and older skepticisms. His four-part book constructs a positive perspective on the possibilities of such a skepticism; connects it with inquiry and objectivity; applies it to the paranormal, religion, and fantasy; and shows how it is vital to ethical and political judgments. The cumulative nature of these parts comes together in a cogent plea for, and description of, "eupraxophy," Kurtz's recently coined term for development of the wisdom of good practice. Good practice is what life is about and is key in understanding the logic and necessity of his new skepticism. Good practice also provides a vantage point for extending Kurtz's thoughts on a life worth living well.

The New Skepticism demonstrates that one should not use skepticism in one field only, such as the paranormal, but that it should be applied, where possible, to all fields of inquiry.

To get to the heart of the matter, Kurtz says skepticism can be prudently used "as an essential methodological rule enabling us to examine critically all claims to knowledge and affirmations of value" (p. 9). It is sine qua non for the types of grounded, objective inquiry that have enabled us to make improvements in scientific, technological, and everyday life. Certainly without the judicious use of a focused, methodological, and situation-specific skepticism we would have been held hostage by superstition and authoritarianism. However,

skepticism has gotten a bad rap, philosophically and practically, because it has become associated with a negative or neutral attitude toward vital life issues. This, according to Kurtz, did not, and does not, have to be. Thus in the first part of the book he puts his new view of skepticism into perspective by contrasting it with nihilism and mitigated skepticism. The former is a complete rejection or neutrality regarding all claims to knowledge; the latter tells us to act *as if* we had knowledge about the exigencies of life while still retaining the deep-seated belief that this pretense would be easily seen through if it were ever seriously examined.

According to Kurtz, we would do better if we grounded our skepticism, as the scientist has, in the wisdom we have gained in dealing with the problems of practical life. For in our practical life, in actual situations, we do not doubt whether a real world exists, or that an action may be necessary on our part, or that some ways of conducting ourselves are better than others. In our practical life we have learned to use skepticism in a limited and focused way to better deal with real problems; in our practical life we have learned to suspend judgments, question assumptions, seek evidence, look for counterexamples, attempt to reason accurately, and form warranted assertions; in our practical life we have learned the value of free and open inquiry.

The extreme skepticisms of the nihilist and mitigated skeptic in their classical, modern, and postmodern variations are counterproductive to effective and progressive functioning in the world. They negate the gains we have made constructing reliable knowledge and defensible values through our wise and sustained encounters with real events. Worse yet, nihilistic and mitigated skepticisms allow irrational faiths to take hold. For if we cannot really know anything, it does not matter what we believe. Beliefs thus become fantasies rather than guides to effective action.

In the second part of the book Kurtz provides a deeper analysis of inquiry and objectivity. The key to this endeavor is his attempt to move us beyond the egocentric predicament, the notion that we are encapsulated in our world of private experiences and thus never really in touch with reality. According to Kurtz, the egocentric perspective has psychologized knowledge, has reduced the world to subjectivity, and is an erroneous and dangerous intellectual and practical cul de sac. In its place he offers us the notion of an "act-centric" perspective. Rather than viewing knowledge as passive appearances to an alienated ego, he sees it as the hypothetical and tested response of an active agent trying to act intelligently in real situations. Instead of using as a guide some absolute notion of religious faith, tradition, intuition, deduction, or induction, Kurtz suggests that we use "co-duction," the judicious mingling of evidence from a variety of perspectives so we can get a more adequate handle on real events and problematic issues. Thus knowing, from this perspective, is an active affair between knower and the known and ideally involves "true beliefs intersubjectively corroborated by reference to objective factors observed, examined, and tested" (p. 94).

Kurtz next applies his criteria for active, evidential, and reasonable knowledge to the paranormal, religion, and fantasy. All three come up short. Upon examination, there is no justified reason for believing in reincarnation or faith healing; the supernatural object of religious belief is either unintelligible or indefensible; and the disposition to seek comforting

beliefs runs deep but is fundamentally misguided. A sensitive critical intelligence based on self-correcting inquiry, although not always easy to develop and sustain, is still our best guide to a sound and satisfying life. This enables us to critically examine knowledge and value claims, and to better seek and extend the goods of life.

The last section of the book applies skeptical inquiry to the judgments of ethical, political, and daily practice. In the realm of ethics, Kurtz argues against ethical nihilism and mitigated ethical skepticism. It is possible, he claims, to make positive knowledge assertions about matters of value. Ethical inquiry can lead to the common moral decencies, that is, "prima facie rules that in general apply to all civilized societies" (p. 291). These rules, according to Kurtz, are transcultural and apply to any group that is to be judged "civilized." The task for individuals is to be able to use these rules as hypothetical plans for action as they attempt to satisfy their needs in a pluralistic and changing world. Again no easy task, but one that is aided by a healthy unbelief and a sensitive and imaginative intelligence. This of necessity also applies to the political realm, where again we have to fight against nihilism and mitigated skepticism, which can lead to various forms of fanaticism, alienation, or apathy.

The manifestation of the new skepticism in political processes is democracy. Democracy, for Kurtz, is justified on methodological grounds; it is a social method of publicly open and self-correcting inquiry. According to Kurtz, "It is tested experimentally. In the long run those societies that are open will tend to have less duplicity and cruelty and there is less likelihood that injustice will remain hidden. In opening the public square to debate, new discoveries and new ideas are likely to emerge" (p. 325). Democracy honors the rights of individuals and builds on the necessity to use our social intelligence to work through our common concerns. It too is not easy, but what is the alternative?

Thus Kurtz has presented a strong and systematic case for a new skepticism, one that strengthens our resolve and invites us to use our intelligence to live well. He builds on his previous works and again brings the intellectual high ground of philosophy down to earth. In addition, he also goes to the barricades and deals with issues other, like-minded thinkers ignore or attempt to wish away. As a public intellectual he presents a eupraxophy that is compelling and passionate. He says much, says it well, and models what he argues for. Dogmatists and true believers of a variety of stripes are taken on—theists, atheists, New Agers, Marxists, libertarians, laissez-faire capitalists—and castigated for their unwillingness to examine their assumptions or methods of thinking and acting. Fighting his proclivity for Promethean proclamations for the most part, he demonstrates an engaged sensitivity and critical perspective that seeks to get to the heart of vital existential issues and offers nondogmatic, constructive ways of moving forward. Quite simply, he gives us a way to answer the absurdist, the fanatic, the true believer, the total skeptic, and the escapist. We have in a succinct and cogent form arguments against epistemological egocentrism, ethical nihilism, and political fanaticism. This is an important intellectual and practical contribution. What more could we want?

However, a book should be judged not only on what it says but also on what it leaves out. In the case of *The New Skepticism* what is left out is an

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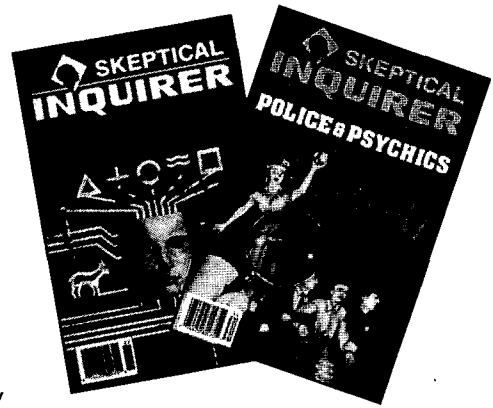

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WINTER 1979-80 (vol. 4, no. 2): The 'Mars effect' — articles *by Kurtz, Zelen, and Abell; Rawlins; Michel and Françoise Gauquelin.* How I was debunked, *Hoebens.* The metal bending of Professor Taylor, *Gardner.* Science, intuition, and ESP, *Bauslaugh.*

FALL 1979 (vol. 4, no. 1): A test of dowsing, *Randi.* Science and evolution, *Godfrey.* Television pseudodocumentaries, *Bainbridge.* New disciples of the paranormal, *Kurtz.* UFO or UAA, *Standen.* The lost panda, *van Kampen.* Edgar Cayce, *Randi.*

SUMMER 1979 (vol. 3, no. 4): The moon and the birthrate, *Abell and Greenspan.* Biorhythms, *Hines.* 'Cold reading,' *Randi.* Teacher, student, and the paranormal, *Kral.* Encounter with a sorcerer, *Sack.*

SPRING 1979 (vol. 3, no. 3): Near-death experiences, *Alcock.* Television tests of Musuaki Kiyota, *Scott and Hutchinson.* The conversion of J. Allen Hynek, *Klass.* Asimov's corollary, *Asimov.*

WINTER 1978-79 (vol. 3, no. 2): Is parapsychology a science? *Kurtz.* Chariots of the gullible, *Bainbridge.* The Tunguska event, *Oberg.* Space travel in Bronze Age China, *Keightley.*

FALL 1978 (vol. 3, no. 1): An empirical test of astrology, *Bastedo.* Astronauts and UFOs, *Oberg.* Sleight of tongue, *Schwartz.* The Sirius "mystery," *Ridpath.*

SPRING/SUMMER 1978 (vol. 2, no. 2): Tests of three psychics, *Randi.* Biorhythms, *Bainbridge.* Plant perception, *Kmetz.* Anthropology beyond the fringe, *Cole.* NASA and UFOs, *Klass.* A second Einstein ESP letter, *Gardner.*

FALL/WINTER 1977 (vol. 2, no. 1): Von Däniken, *Story,* The Bermuda Triangle, *Kusche.* Pseudoscience at Science Digest, *Oberg and Sheaffer.* Einstein and ESP, *Gardner.* N-rays and UFOs, *Klass.* Secrets of the psychics, *Rawlins.*

SPRING/SUMMER 1977 (vol. 1, no. 2): Uri Geller, *Marks and Kammann.* Cold reading, *Hyman.* Transcendental Meditation, *Woodrum.* A statistical test of astrology, *McGervey.* Cattle mutilations, *Stewart.*

FALL/WINTER 1976 (vol. 1, no. 1): Dianetics, *Wallis.* Psychics and clairvoyance, *Fine.* "Objections to Astrology," *Westrum.* Astronomers and astrophysicists as astrology critics, *Kurtz and Nisbet.* Biorhythms and sports, *Fix.* Von Däniken's chariots, *Omohundro.*

(continued from p. 175)
analysis of the efforts to develop communicative rationality, the type of thinking that enables us not only to "get it right" but also to "get it together" in moving in defensible directions. In particular, the discourse that has developed around the work of Jurgen Habermas, perhaps the most influential philosopher of the late twentieth century, is conspicuously omitted in the text. Habermas's attempts to rationally and systematically connect our interest to control and manipulate the environment with our deep-seated interests to understand each other's perspectives and transform asymmetrical relations of power need to be examined in the light of Kurtz's new skepticism. Perhaps here we will find ways to not only answer those with different perspectives but also learn to move forward together on issues of mutual concern. This too will not be easy, but I think it will be well worth the new skeptic's efforts. Paul Kurtz's *The New Skepticism* has laid the groundwork for such efforts. It is a book to be read, discussed, and used to construct beliefs and practices worth having.

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Antidote to Science-Bashing

The Unnatural Nature of Science. By Lewis Wolpert. Harvard University Press, Cambridge, Mass., 1993. 191 pp. Hardcover, $19.95.

TERENCE HINES

This is an important book filled with many insights about science and scientists. It provides numerous arguments against those who adopt the "science-bashing" attitude so popular these days.

One of Wolpert's major points, and the one reflected in his title, is that the cognitive processes required for scientific thought and progress are very, very different from those that underlie so-called common sense. This is because the world is simply too complicated to be comprehended by the type of simple, day-to-day observations, never systematically made, that result in commonsense explanations for various phenomena. Thus, commonsense explanations are frequently wrong. As he points out, "Commonsense provides no more than some raw material required for scientific thinking" (p. 17).

Another of Wolpert's valuable contributions is to draw a strong distinction between science and technology. It is commonly believed that science is necessary for technology, and this may happen to be true in modern (twentieth century) times. However, technology arose eons before science did. The Bronze Age peoples, who had learned, through trial and error, how to smelt and combine copper and tin, certainly had no scientific theory of metallurgy. While many nonscientific cultures have made impressive technological ad-

vances, scientific thought developed uniquely in Greece and has had an influence on technology only in this century.

Wolpert's strong distinction between science and technology has important implications for the moral responsibilities of scientists when it comes to such issues as the development of the atomic bomb, genetic therapy, and the like. Wolpert argues, most refreshingly it seems to me, that scientists and science bear no responsibility for the use of the atomic bomb. The bomb was based on scientific principles that would have been discovered sooner or later had they not been discovered by those working on the Manhattan Project. The decision to use the bomb was a political one and no blame or praise should accrue to science or scientists for the results of the decision to use it.

Wolpert makes a further interesting argument regarding the issue of the ethical responsibilities of scientists. He notes that the hand-wringing (my term) of ethicists over such matters as the atomic bomb, genetic engineering, and other new techniques, are often the result of ignorance about the basic scientific principles that allow the new techniques to work. No one, he points out, tried or tries to hold science responsible for the deaths in World War II caused by the fire-bombing of Germany or Japan, by conventional bombs, by firearms, or by artillery, in spite of the fact that tens of millions were killed by these standard weapons and the additional deaths due to the two atomic bombs were a relatively small addition to this horrible total. It was, rather, the newness of the technique that caused the moral uproar.

This seems to me to be a powerful and useful argument, and it is interesting to see Wolpert apply it to the issue of genetic engineering, specifically to the possibility, at some future date, of using such techniques to improve, say, intelligence, beauty, height, and so on. It has been argued by some that such uses pose large ethical problems, such as the one that would arise from the fact that only a few could afford to pay for them. But, as Wolpert cogently points out, there are already techniques available (plastic surgery, better education, etc.) that enhance some of these characteristics. They are simply less effective than a genetic procedure could be. There is little hand-wringing by ethicists over the fact that some people can afford to have plastic surgery or to send their children to better schools. The difference seems to be that, while plastic surgery and education are understood by the ethicists, the basic facts of the science that makes genetic engineering a possibility are not. Thus, in typical fear of the unknown, a hue and cry against the new technique is raised.

Wolpert does not, of course, argue that scientists have no responsibility to the public at large. He strictly limits that responsibility to two areas. First, scientists must convey their findings to the public in a clear fashion. Second, especially in the area of controversial fields of research (ethnic differences in IQ, for example), the reliability of the results must be made clear. However, the use to which any scientific finding is put is a social and political question and not the responsibility of scientists, who are no better (or worse) at making such judgments than anyone else. Closely related to this topic is Wolpert's contention that science cannot answer all types of questions. For example, moral problems are beyond the ability of science to solve, although scientific information may play an important role in informing the body politic about the

issues a specific moral question involves.

Another topic tackled by Wolpert is that of creativity in science, and again he makes some original points. He argues that creativity in science is quite different from creativity in the arts. Creativity in science is limited by the nature of physical reality. No matter how creative, no scientist will ever discover or create an element between number 4 (beryllium) and number 5 (boron) on the periodic table. Further, if a scientist isn't creative enough to discover a particular phenomenon, or to find an explanation (theory) for it, some other scientist almost certainly will. Creativity in the arts is not limited in the same way. If Beethoven had not written his *Ninth Symphony* between 1822 and 1824, no one else would have written it—say, in 1902.

Wolpert is especially critical of sociological and philosophical relativists who claim that science is not a special, privileged way of knowing, but simply a socially constructed belief system no more valid than the beliefs of some primitive tribe deep in the jungle. It is perhaps not surprising that such silly claims have sprouted from the fetid soil of modern sociology and philosophy, two "disciplines" whose connections with reality seem to get more and more tenuous every year. In regard to philosophy, Wolpert makes a very interesting point that I've not seen made elsewhere. He acknowledges that philosophers have had a great deal of difficulty with the problem of what constitutes truth and how to recognize whether something is true or not. But, he argues, this is a problem that philosophers have no business trying to impose on other fields. In other words, the fact that philosophers are still debating the nature of truth should have no more effect on the practice of science than, for example, the fact that the average business person is ignorant of the details of accountancy should have on the day-to-day behavior of a CPA. It turns out that scientists have, appropriately, it seems to me, largely ignored the work of philosophers of science and sociologists. A similar point is made by Steven Weinberg in his excellent *Dreams of a Final Theory* (Pantheon, 1992).

In attacking the position that science is a purely social construction, on an equal footing with primitive (or not so primitive) religions, Wolpert makes a telling point that I've also not seen made before. He points out that in real science one must learn to doubt one's own belief system. That is, one must admit that there are phenomena for which no explanation can be given in current theory and even that the entire theory may be wrong. Thus, one is always, at least in the ideal, searching for a theory that will encompass more phenomena. In strong contrast, belief systems based on magic and religion do not even admit the possibility of being wrong, or of anything being unexplained. Any question can be answered (however unsatisfying the answer may be to one trained in scientific thinking) from within the totally closed system. Why did Grandma get run over by the cement truck? It was God's will. Or it was bad karma. Or her brother's sister's son's dog was having a triple critical biorhythm day. Why does the moon move slowly across the sky? Because the great God Whozits uses it as a boat to cross the sea of night. And on and on and on.

This is a wonderful book.

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Close Encounters with Mathematical Cranks of the Third Kind

Mathematical Cranks. By Underwood Dudley. Mathematical Association of America, Washington, D.C., 1992. 372 pp.

A Budget of Trisections. By Underwood Dudley. Springer-Verlag, New York, 1987. 169 pp.

ROBERT L. FOOTE

Well, what's the excuse for this *book?*
I guess that what's in it isn't in any other book.
Like what?
Things about mathematical cranks and eccentrics. No one pays much attention to them. . . .
So this is a book about nuts?
No, no. They're not nuts. Well, a few are, but most aren't. . . .
I see. So why would anyone want to read it?
Well, cranks are *interesting*. . . .
What would you say if I said that cranks are odd and anyone who's interested in them is probably a little peculiar too?
What? But . . .

—*Mathematical Cranks*, p. v

For better or for worse, pseudo-mathematics does not enjoy the popularity among cranks that other subjects seem to have. It just doesn't have the same appeal as psychic claims, astrology, or UFOs. Nevertheless, mathematical cranks do exist, as mathematics departments at many major universities are well aware. When I was a graduate student at the University of Michigan, it was not uncommon for the departmental mailboxes to be stuffed periodically with the local crank's most recent proof of the rationality of π or $\sqrt{2}$.

While most crank mathematics winds up in the wastebasket (frequently after serving as departmental entertainment), occasionally a well-meaning mathematician makes the mistake of responding to a crank, pointing out his errors, hoping to set him straight. Thus may begin a series of communications between crank and mathematician (mostly *from* crank *to* mathematician), usually ending when the mathematician is forced to be rude, or the crank becomes angry and goes in search of a more "tolerant" mathematician. The moral of the story is: Don't get involved with a crank.

While frequently giving this advice to others, Underwood Dudley, professor of mathematics at DePauw University in Greencastle, Indiana, has made it his professional hobby to collect the works of modern mathematical cranks, to correspond with them, and even to meet them. In these two books, he shares his fascinations and frustrations with people bent on pseudo-mathematics.

What types of things do mathematical cranks work on? Most of Dudley's examples can be placed into two broad categories: (1) real mathematics that has been twisted, has been misunderstood, or has had its significance horribly exaggerated, and (2) impenetrable nonsense.

Into the first category goes any work based on an actual mathematical

problem whose author understands, at least at some level, the basic mathematics behind it, but who then goes on to display a lack of logical reasoning, often caused by a zeal to achieve the desired result. Although most of modern mathematics is safely beyond the reach of crankery (I don't imagine there are many cranks working on problems in vector bundles over homogeneous spaces or topological supercompactifications), everyone knows *some* mathematics, and there are a number of problems whose statements can be understood by anyone with a high-school mathematical background.

A Budget of Trisections, written in the spirit of Augustus De Morgan's *A Budget of Paradoxes* (see article by Milton Rothman, *SI*, Spring 1992), is devoted entirely to attempts to trisect the angle (given an angle, divide it into three equal parts) using only compass and straightedge. This is one of the three classical construction problems of Greek geometry, each of which has attracted its share of cranks. The other two are squaring the circle (given a circle, construct a square having the same area), and duplicating the cube (given a cube, construct a second cube with twice the volume), again, using only compass and straightedge. Over the years many futile attempts have been made at these constructions. In the early 1800s they were proved impossible.

Impossible? Ah, you hear the cranks say, nothing is impossible. Think of the excitement of doing something no one has ever been able to do, and the fame and fortune that surely go with it. What child has never thought this? Many people, some budding mathematicians (the reviewer included), spent some time in their youth attempting these constructions until they got tired or finally understood the meaning of mathematical impossibility. Cranks, on the other hand, don't understand, and apparently never get tired.

> In more than 12,000 working hours I have in the course of 40 years found this solution. I am not a mathematician but a retired civil servant, now 69 years of age. (*A Budget of Trisections*, p. 19)

The proof that these constructions are impossible is one of mathematics' triumphs. Modern mathematics is full of insightful connections between its varied branches—in this case between geometry and algebra. In brief, given an initial collection of points in a plane where coordinates have been established, the points that can be obtained from them by compass and straightedge constructions are those whose coordinates are related to the coordinates of the original points by solutions of linear and quadratic equations. Thus the coordinates of the constructed points are formed through combinations of addition, subtraction, multiplication, division, and taking square roots. Higher roots are possible, but only in powers of 2, that is, fourth roots, eighth roots, sixteenth roots, etc. The important fact is that no cube roots are possible. Duplicating the cube would involve constructing a segment of length $\sqrt[3]{2}$, the solution of $x^3 = 2$. Similarly, trisecting an angle is related to the solution of another cubic equation. Squaring the circle would involve a segment of length π, but π is transcendental; that is, it is not the solution of *any* polynomial equation with integer coefficients, let alone linear or quadratic. The conclusion is that these constructions are impossible.

Trisectors, cube duplicators, and circle squarers balk at algebraic disproofs of what they think they have proved. If the problem is geometric,

they say, any refutation should be geometric.

> Those who are skeptical should offer something more than rhetoric or argument in order to disprove geometrical facts. . . . If the lines constituting the respective pairs of trisectors of both sectors do not intersect on the quadrantal arc they should show by *the ruler and compasses where they do intersect.* (*A Budget of Trisections*, p. 27)

The only thing that will convince this trisector that his construction is wrong is a correct trisection, which is impossible!

Cranks who work on these three classical problems are under the delusion that solutions to them would be of great importance and would revolutionize mathematics and science. In fact, all three problems have simple solutions, but by constructions that are not Euclidean; that is, they use more than compass and straightedge. For example, it is easy to trisect an angle using a compass and a marked straightedge (i.e., a ruler). These constructions were known to the Greeks, and Dudley includes them.

Mathematical Cranks covers a wide variety of pseudo-mathematics topics, including Fermat's Last Theorem, the Four Color Theorem, and the two remaining problems from classical Greece.

Fermat's Last Theorem is inaccurately named—it is really a conjecture. It is easy to find positive integers x, y, and z that satisfy $x^2 + y^2 = z^2$. For example, $3^2 + 4^2 = 5^2$ and $5^2 + 12^2 = 13^2$. Fermat noticed that he could not find any positive integers that would solve $x^3 + y^3 = z^3$, or for that matter $x^n + y^n = z^n$ for any integer exponent n 3, and he conjectured that there are none. He evidently thought he had a proof, for he wrote a note to that effect in the margin of one of his books. The note was discovered after his death, but no sign of any proof, and mathematicians have been trying to find one ever since.

(Perhaps Fermat's Last Theorem has finally been proved. Shortly after this review was written, Andrew Wiles, professor of mathematics at Princeton University, announced that he has a proof, an event noteworthy enough to be covered by the media (*New York Times*, June 24, 1993, A1, and June 29, 1993, C1). His 200-page manuscript will no doubt be carefully scrutinized by the world's algebraic geometers and their graduate students over the next several months. If no errors are found, the book may be closed on this famous problem.)

The Four Color Theorem states that every map can be colored using at most four colors. Countries in a valid map must be connected (so Michigan would not be allowed), and different colors must be used for adjacent countries. This was the Four Color Conjecture up until 1976. Its proof caused immense controversy in the mathematical community since it involved hundreds of hours of computer calculations, but is now generally accepted.

The appeal of these problems for cranks is immediate. As with the Greek constructions they are easily understood, and when working on them they give one the feeling that success is imminent. Dudley observes that many of the works of cranks contain

> pages, in some cases a few and in other cases many, of elementary and correct reasoning followed by a quick descent into incomprehensibility, then a return to the surface with something like "therefore $x^n + y^n = z^n$ has no solutions in positive integers" that does not follow from what has gone before. (*Mathematical Cranks*, p. 117)

He goes on to classify the cranks themselves.

> Cranks of the first kind say "I am right." Period. No reason necessary, no reason given. Cranks of the second kind say "I am right because . . . ," and proceed to try to justify their work with mathematics. Cranks of the third kind recognize that what they have done conflicts with mathematics and therefore, since either they or mathematics are incorrect, they try to change mathematics to fit what they have accomplished. There are no cranks of the fourth kind. (p. 234)

Now, what about some of the "impenetrable nonsense"? When a trisector gets carried away, incredible tangles of lines and circles can result. Take Figure 1 for example. Anyone care to figure out what is going on here?

Others go in for arithmetic:

> The Unity of 1
>
> It is proposed that 1 is a unity of 1 in itself but that 1 evolves as a unity of 1 in sums of 1 by ratios of sums of 1. Thus, a simple unity of 1 evolves in ratios of sums of 1 as 1 111 111 and a complex unity of 1 evolves in ratios of sums of 1 as $111\ 111\ 111^1$, $1\ 111\ 111\ 111^2$, and $1\ 111\ 111\ 111^3$.
>
> It is proposed that the sum of $1\ 111\ 111\ 111^2$ evolves further as

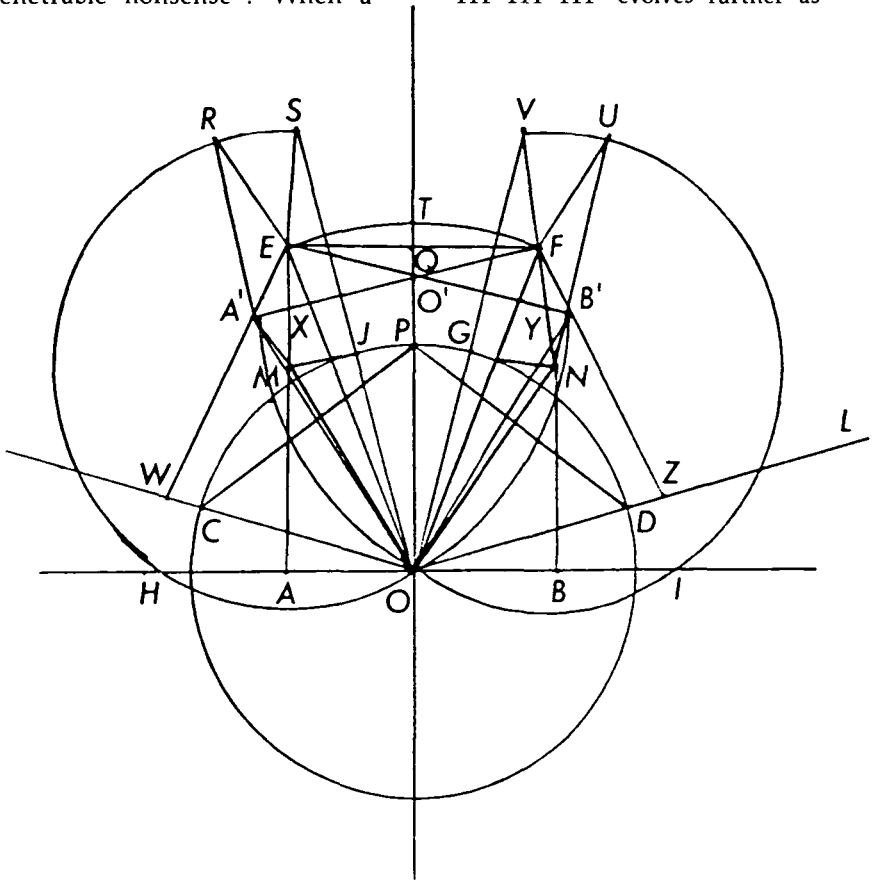

FIGURE 1

> a principle of unity in a simple compact ratio defining a simple mean value of 1 in 123 in the simple ratio (1 + 3)/2 = 2. A constant mean value of 1 in 123 456 789 0 is proposed in which the unity of 1 is conserved by a more complex ratio. . . . (p. 264)

Dudley informs us that this continues on through a stack of paper two inches thick!

We also have the "World's Most Complete Mathematics Library," which includes "Enough Mathematics to Do Anything That Can Be Done." Dudley tells of a photograph of the author standing in front of his library—more than forty loose-leaf binders. Here is a sample.

> The 3 is 1 + 2 = 3 (See DIGITS.). BASE = 10, and 10 - 3 = 7; 2 CUBED - 1 CUBED = 7 is the WHOLE NUMBER FRAGMENTATION FORMULA for SINGLES and PAIRS in the first break of CONTINUOUS CHANGE. (p. 17)

And so it goes. As Dudley says, "It is difficult to know what to make of it."

In these books we get more than just the silly mathematics. Dudley describes the people who produce it, giving us a detailed view of the makeup of several mathematical cranks. Many of their characteristics will be familiar to readers of *SI*. In *Mathematical Cranks* we get a step-by-step account of one person's "descent into crankhood," as he attempts to gain recognition for his solution of the Four Color Theorem. After some frustrating communications with a few mathematicians at a nearby institution, he sends out a mass mailing to several prestigious mathematics departments. When errors are pointed out, he rewrites his paper, making "corrections." He posts notices on university bulletin boards offering $1,000 to anyone who can disprove him. Finally, in disillusionment and anger, he sends a form letter to an unknown number of mathematicians, claiming conspiracy:

> [The enclosed] report makes it unmistakably clear that I am aware of the desperately shabby, dishonorable treatment I am receiving at the hands of the mathematics community, simply because I dared to be the first to solve, by a short elegant method, a problem that has baffled *your best people* for over 100 years. (p. 75)

Included in the letter is a threat to take the matter to the media if acknowledgment for his work is not forthcoming.

There is much more. One can learn about arthroids, bines, trines, and quanes, part of the theory of plerology. There are the point's synthesis and the antizero, part of the philosophy of the sphere. There are heavy numbers, prayer matrices, bits of crank physics ($E = MC^2$), several alternative values of π, and an account of the amazing role of the number 57 in the American Revolution.

Thank goodness mathematical cranks are not as common as astrologers, UFO chasers, or psychics, but they do exist, and these books belong on the shelves of both skeptics and teachers of mathematics.

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Saint George and the *Baryonyx*

Dinosaurs by Design. By Duane T. Gish. Illustrated by Earl and Bonita Snellenberger. Creation-Life Publishers, Master Books, El Cajon, Calif., 1992. 88 pp. Hardcover, $14.95.

DANIEL J. PHELPS

Both children and adults are fascinated by dinosaurs (the phenomenal success of this year's blockbuster *Jurassic Park* is just the latest example), and for many young people popular accounts of dinosaurs are their first encounter with science. Indeed, an informal poll of paleontologists and geologists will reveal that many were attracted to their field because of an early interest in dinosaurs. Apparently young-earth creationists are now exploiting this interest in order to promote their pseudoscientific beliefs. The recent publication of *Dinosaurs by Design*, by Duane Gish, is a prime example.

Advertised as being a "creation science" book aimed at junior to senior high-school students, the book appears to be written with an even younger audience in mind. It is attractively produced and filled with high-quality color illustrations. The reproductions of dinosaur paintings are above average for juvenile literature. While most accurately depict the dinosaurs themselves, the addition of people, buildings, the Ark, and modern animals to the illustrations help promote fundamentalist beliefs.

The sheer number of errors, half-truths, and outright deceptions in the book make it difficult to review in a limited space. Among the more egregious errors are statements claiming that all mutations are bad, that transitional forms do not exist, and that fossilization was a product of Noah's Flood. The claim that "all dinosaurs not on Noah's Ark were drowned in the Flood" (p. 8) sets the tone for the rest of the book. To Gish's credit, no mention is made of the fraudulent Paluxy Mantracks.

Fortunately, there is only a short section on geologic time; it ridicules and misrepresents the views of legitimate geologists, accusing them of "circular reasoning." Nowhere in the book is there mention of the terms *Mesozoic, Triassic, Jurassic,* or *Cretaceous.* A post-Noah's Flood catastrophe is invoked as being responsible for the formation of the Grand Canyon. Moreover, the reader is misled into believing that this concept is widely accepted by geologists. This section concludes by quoting Institute for Creation Research geologist Steve Austin as saying, "It is reasonable to think that fossils and rocks could have formed rapidly only thousands of years ago" (p. 15).

A significant amount of *Dinosaurs by Design* is devoted to making strange cryptozoological claims. Apparently, Duane Gish wishes to convince us that dinosaurs and other Mesozoic reptiles lived until recent times and that some are still with us. He uses an example of nineteenth-century tabloid journalism to support one of these claims. Gish cites an April 26, 1890, issue of the *Tombstone Epitaph* that gives a dubious account of two cowboys killing a bizarre creature that Gish claims may have been the pterosaur *Quetzalcoatlus.* This particular pterosaur is known to have lacked teeth

(Wellnhofer 1991: 140-145). Because the *Tombstone Epitaph* account says the creature had an 8-foot-long alligator-like head with a mouth full of teeth, two separate illustrations of *Quetzacoatlus* show a pterosaur with sharp teeth.

Gish also dredges up several sea-serpent and lake-monster tales to make his case. Thus the Loch Ness Monster becomes the Cretaceous plesiosaur *Elasmosaurus*. Additionally, it is suggested that the Mokele Mbembe of the Congo River is a dinosaur. (For a good acount of this living dinosaur legend, see Jacobs 1993). In all seriousness, when referring to one sea-monster account, Gish says, "It seems you never have a camera when you need it!" (p. 87).

On page 86 appears a picture of an unusual decomposing animal hauled aboard the Japanese fishing boat *Zuiyo Maru* in 1977 off the coast of New Zealand. A crewman photographed and took tissue samples of this putrid carcass before it was thrown overboard. Ever the mystery monger, Gish quotes Japanese scientists who believed this to be a plesiosaur, but Gish never mentions that the tissue samples showed this creature was really a shark (Cohen 1982: 174). Moreover, similar mistaken identifications have been made many times and, in each case, the mysterious creature turned out to be the filter-feeding basking shark (*Cetorhinus*). Rotting basking sharks tend to lose their jaws and gill structures, their dorsal fin, and part of their tail fin after a short time. The long "neck" and "tail" are the result of decomposition or scavenging of the flesh adhering to the vertebrae (Gould 1968: 208). The resulting carcass looks somewhat plesiosaurlike. These circumstances occur so often that basking sharks have been nicknamed "pseudoplesiosaurs" (Cohen 1982: 174-176; Anon. 1977: 225; Heuvelmans 1968: 134-135).

In one of the most absurd parts of the book, medieval dragon legends are said to be referring to dinosaurs. My jaw dropped when I encountered the illustration of Saint George slaying the dinosaur *Baryonyx* (p. 81). Fire-breathing dragons are accounted for by claiming, with no supporting evidence, that the unusual crest on the dinosaur *Parasaurolophus* contained combustible liquids. Paleontologists hypothesize that the crest on this dinosaur functioned as an acoustic resonator and as a display structure (Weishampel 1981). Additionally, Gish claims that the Old Testament's Book of Job describes dinosaurs when discussing Leviathan and Behemoth.

Amazingly, the section describing individual dinosaur genera contains much legitimate information, but references to Noah's Flood and other creationist beliefs are mixed in. The following examples are typical:

Claim: The discovery of 30 *Iguanodon* skeletons in a Belgian coal mine are explained as resulting from the "great Flood of Noah" (p. 25).

Reality: Norman (1987) studied this fossil discovery and found that "there was no catastrophic event which led to the accumulation of fossils. The mine records indicate at least four separate depositional layers. This is supported by taphonomic evidence revealed in the reconstruction of the excavation site" (p. 72).

Claim: An armored dinosaur was found buried in ice in Antarctica (p. 36).

Reality: This fossil was found in sedimentary rocks known as the Santa Marta Formation (Weishampel 1990: 139). This fossil was *not* found in ice.

Claim: Duckbill dinosaurs with skin preserved were "buried so quickly that their flesh did not have time to decay before they were completely buried in

mud" (p. 39).

Reality: These fossils are known as "hadrosaur mummies" to paleontologists. The best specimens have a contorted appearance with the neck bent back and patches of skin over much of the torso. The skin impressions cling tightly to parts of the skeleton and tendons as if dried by the sun. Indeed, the carcasses underwent considerable decay and desiccation before burial (Lull and Wright 1942: 110-117, plates 7, 8, and 9; Bakker 1986: 146-159).

Claim: The "Great Flood of Noah" is the best explanation for a mass burial of allosaurs found in Utah (p. 48).

Reality: Molnar and Farlow (1990: 211-212) briefly reviewed the taphonomy (postmortem history) of the *Allosaurus fragilis* specimens found in Cleveland-Lloyd Quarry in the Jurassic Morrison Formation of central Utah. They found that although a detailed account of the formation of the fossil beds had not been formulated, certain facts cannot be ignored. They said: "The orientation of the elements when uncovered suggests that they were scattered and became oriented before burial. This is consistent with the occurrence of breakage and loss of delicate structures, which suggests that scavenging took place. . . . Such invertebrates and plants as have been found indicate deposition in a shallow, quiet, freshwater body" (p. 212).

Evolution comes under direct

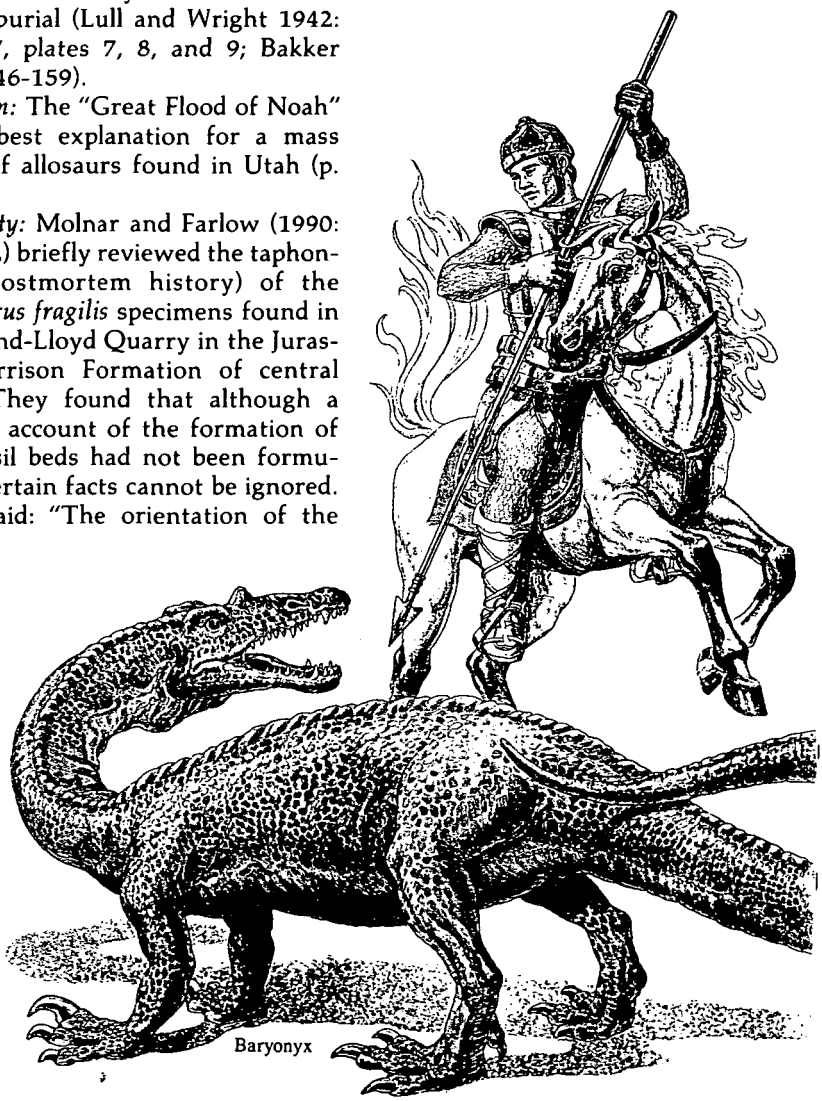

Illustration from Dinosaurs by Design.

attack in sections dealing with transitional forms and the origin of birds. The section titled "Evolutionary Fairy Tales" relies almost entirely upon ridicule and misinformation to make its case. The discussion of dinosaurs and the origin of birds is not much better. Gish plays word games by claiming that evolutionists are absurdly mistaken in saying that birds are descended from lizard-hipped (saurischian) dinosaurs when the other main group of dinosaurs is known as bird-hipped (ornithischian). Although Gish has a background in biology, he is either unable or unwilling to present the concept of evolutionary convergence to his young readers.

The section on the origin of birds is illustrated with a nice reconstruction of *Archaeopteryx*. However, in the text, Gish mentions only the claws on the wings as reptilian features. He neglects to mention other features, including the sharp teeth set in a reptilian-looking jaw, the reptilian skull, the long bony tail, and the lack of an ossified sternum, all of which suggest that birds are descended from small theropod dinosaurs or some archosaur closely related to dinosaurs (Benton 1990: 212-213; Wellnhofer 1991: 180).

Fundamentalist theology is presented as science by Gish. As may be expected, this mixing of science with fundamentalism inspires some bizarre ideas. It is suggested that carnivorous dinosaurs were originally vegetarian but became carnivores after the Fall of Man. Gish says:

> Did god design the teeth, jaws, and claws of *Tyrannosaurus* and other meat-eating dinosaurs so that these creatures could kill other animals and eat their meat? Not necessarily; many of these may have been designed originally for eating plants and fruit, just like the teeth of the Giant Panda, gorillas, and fruit-eating bats. No one knows for sure just how and why animals started eating meat, except that it was after the Fall. (p. 69)

Furthermore, an evangelical version of the Flood is given wherein the animals are commanded to board the Ark by God, who then puts them into a miraculous hibernation. A miracle is invoked to answer any possible objection. To save space, juvenile dinosaurs are taken aboard. Dinosaur extinction is explained in terms of post-Flood climate changes, culminating in the Ice Age. Apparently, Gish only believes in one ice age, while geologists have evidence for several episodes of glaciation in the Pleistocene Epoch alone.

Obviously the horrible science and strong fundamentalist emphasis of this book make it inappropriate for any child and all public-school libraries. I do recommend this book to people combating creationism; it should prove to be an effective tool in stirring scientists out of their apathy regarding the creationist threat. Any scientists wishing to debate Gish can use the contents of this book as a powerful weapon to force him into defending this pseudoscientific nonsense.

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Daniel J. Phelps lives in Lexington, Kentucky.

End of the 'Crop Circle' Circus

Round in Circles: Physicists, Poltergeists, Pranksters and the Secret History of the Cropwatchers. By Jim Schnabel. Hamish Hamilton Ltd., London, 1993. 295 pp. Hardcover, £16.99 (approx. $25.00).

ROBERT A. BAKER

Sometime in the future, when the definitive history of human credulity is finally written, two names will play a prominent role: Doug Bower and Dave Chorley. These two Englishmen, both artists in their mid-sixties, managed to pull off one of the great hoaxes of the century and succeeded in confounding and confusing hundreds of determined investigators. The story of their accomplishment, as carefully unfolded by Jim Schnabel in *Round in Circles*, not only drives the final nail in the coffin of the crop-circle mystery but also is a major step toward—one can hope—the eventual demise of the UFO phenomenon.

Most of those who were taken in were, admittedly, either firm believers in the UFO extraterrestrial hypothesis or devotees of, or dabblers in, paranormal and occult practices. A few of the cropwatchers, however, like meteorologist Terence Meaden, were scientifically trained and had established respectable reputations in the halls of science before turning their attention to the strange designs showing up in England's grain fields.

Incredibly, what began as a practical joke soon mushroomed into a worldwide, twelve-year-long UFO-logical and media-celebrated mystery of truly prodigious proportions. At the height of the crop-circle fervor just about every journal, newspaper, and TV and radio station on earth carried one or more stories and news items about these mysterious carvings in England's crops. Most thrilled of all, of course, were those who had long been convinced that our planet was being visited by extraterrestrials. To these true believers all of the strange designs, the ancient and runic symbols, the ambiguous messages, and the increasing complexity of the circles,

accompanied by strange lights in the skies, were more than enough to prove—without question—that the cereal carvings were the work of a superior unearthly intelligence. The believers were fully correct, however, on only one count: the circles were related to the UFO phenomenon. But they were created in all their clever complexity by two very innovative earthlings.

One summer evening in the mid-1970s, Doug Bower, who had long been interested in UFO reports, remarked to Dave Chorley that while he was in Australia he had heard a story about a UFO that descended in Queensland and had left a nest of swirled marsh grass. Pointing to a nearby wheat field, Bower asked: "What do you think would happen if we put a nest over there? People would think a flying saucer had landed." The two men soon after took a steel bar that Bower used to latch the door of his shop, walked along a tractor path into a virgin wheat field, and made their first circle. Planting one end of the bar and pivoting around this point on their hands and knees, in approximately 40 minutes they created a circle 30 feet in diameter with neat flat swirls and a precise perimeter, and concealed their entrace trail beneath the laid stalks.

The first summer they made a dozen or more circles. A few more the next summer, and the next, and the next, but no one seemed to notice. By the end of the summer of 1979, they were on the verge of giving up circle-making. Then, in the summer of 1980, they used a different approach, since the iron bar was too exhausting and also damaged the stalks. Using planks about 4 feet long, with ropes tied at each end, they could walk upright holding the plank between them and swish down a 4-foot swath with each step. Since the planks were comparatively light, they could also work faster and longer. Moreover, they decided to make circles only where people could easily see them and where people would naturally associate them with UFOs.

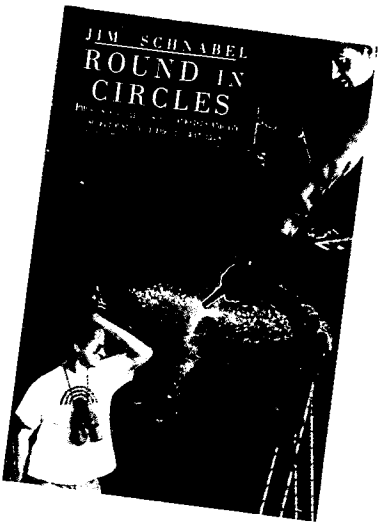
These 1980 circles corralled the attention of everyone—particularly Terence Meaden; the British UFO Research Association (BUFORA) and its Director of Investigations, Jenny Randles; a retired inventor named Pat Delgado; and a young electronics expert named Colin Andrews. These principals, along with Paul Fuller, a UFO buff, and Busty Taylor, a commercial pilot, all came up with their own speculations about how the circles were done. Vortices with electromagnetic powers, whirlwinds, plasmoids, poltergeists, earth energies coming from below the ground, alien lasers and other such arcane rays, as well as a new kind of energy emanating from the human body—all were suggested and vociferously defended by one or more of the experts. Schnabel's book is a step-by-step and blow-by-blow account of how these people were caught up in their own three-ring circus for almost an entire decade before Bower and Chorley put them out of their collective misery by calling the news desks of the *Daily Mirror* and *Today* in September 1991 and giving them the full story.

In one of the saddest incidents reported by Schnabel, Bower and Chorley were asked by *Today* to create an insectogram for them in a field at Sevenoaks, Kent. After it was completed, *Today* called in Pat Delgado, who was adamant in his belief that he could tell the "true circles" from the "hoaxes." After inserting his audio probes in the ground of the circle's center, Delgado declared it was genuine. "In no way could this be a hoax; no human could have done this," he said. Then adding, with perverse

prescience, "This is, without doubt, the most wonderful moment of my research." When Delgado finally heard and was confronted with the truth, he stated: "We have all been conned. Thousands of lives are going to be wrecked over this . . . if everything you say is true. . . ." Unlike Delgado, Colin Andrews did not give in either gracefully or readily, arguing vehemently that Bower and Chorley could not possibly have made all of the circles that were reported—especially those seen in Canada. Of course they didn't. Long before Bower and Chorley threw in the towel, at least a dozen separate groups of pranksters had also taken up the hobby and were bending stalks like mad. Even Schnabel himself joined in.

While one would assume that Bower and Chorley might have been the target for hundreds of legal actions by irate farmers, this was not the case. The act of making a crop circle causes little or no material damage and unless a formation has been severely trampled by tourists it can be harvested without loss merely by lowering the blades of the harvesting machine. Moreover, the receipts from thousands of tourists out to see the artistry compensated the farmers ten times over. Nevertheless circle-making can be an annoyance to farmers who are opposed to crowds, and many did threaten to prosecute. For this reason Schnabel is careful not to be too specific in detailing the circles that he and his colleagues swirled all over southern England when the organized competition came into full flower. Few fields of grain were spared.

Incredible as it may seem, Bower and Chorley, as well as most of their competitors, managed to evade detection year in and year out. On one occasion, they were sure they had been caught. A patrol car parked alongside the area where they were



creating an insectogram. Bower hailed the policeman and walked him over to Chorley's car and showed him his wildlife recording equipment and several letters from the British Library of Wildlife Sounds. The officer promptly apologized for having interrupted their work. On another occasion, they thought they were being shot at, but found that the targets were rabbits instead. Such happenings were extremely rare, however, and in spite of increasingly large numbers of cropwatchers Bower and Chorley managed to create most of their masterpieces undetected and unmolested.

Although the story of the crop-circle hoax is, by far, the most entertaining aspect of *Round in Circles*, skeptics will also be fascinated by the faulty logic and blind allegiance to obviously flawed hypotheses put forth by Meaden, Delgado, Andrews, and others in their vain pursuit of the increasingly complex circles and in their publications: *Circles from the Sky* and *The Circles Effect and Its Mysteries* (Meaden) and *Circular Evidence* and *The Latest Evidence* (Delgado and Andrews). Bower and Chorley care-

fully monitored these various theories and took particularly perverse pleasure in confounding them. They were highly amused to hear Delgado refer to their creations as the work of a "higher intelligence."

They were also delighted with Meaden's arguments that whirlwinds and plasmoids were to blame—not only for the simple circles but also for the triplets and quintuplets. To have their creations attributed to a nonintelligent meteorological mechanism was the last thing the artists expected. To teach Meaden a lesson they decided to make a formation his theory couldn't possibly digest. One night they went down into a lush and ripe grain field; and after they had swirled a simple clockwise circle they then, perversely, swirled an anti-clockwise concentric ring. This first "ringed crop circle" caused a sensation and baffled Meaden for several years. To further bewilder Delgado and his followers, Bower and Chorley made a circle with a ring and added a runway that jutted out from the ring. Then, at the end of the ring they dug a small hole—as if aliens had landed and proceeded to take earth samples. They never dreamed that Colin Andrews would inspect the hole and somehow conclude that a poltergeist had made it.

In an Epilogue, Schnabel makes it clear that creating crop circles is relatively easy. In his words:

> Actually, for all the otherworldliness of the pictograms, making them requires more nerve (or lunacy) than dexterity or design skill. It took me less than two months to move, on the cerealogical scale, from obvious hoaxer to superhuman intelligence, and by the end of the summer, despite the steadfast efforts, I assume of Matt and Paul and Bart and John and other apparent veterans, a few other beginners and I had fully replaced them in the role of "Wiltshire Circlemakers."

Schnabel also reports that after nearly everyone else on the planet had accepted the fact that circles were the work of mortal men, many diehards refused to believe it. Some attributed strange energies to the circles, maintaining that the energies cured their arthritis or other ills. Others argued that the circles were messages from God. Even in late 1992 Colin Andrews, with a group of believers in extraterrestrial visitors, pitched camp at Woodborough Hill and for several weeks shone lights into the night sky in an attempt to make contact with alien craft. Still others currently insist that the crop circles and their makers are part of a vast conspiracy—a secret organization spanning the globe and "comprising, among other subagencies, the CIA, M16, the Vatican, and the Trilateral Commission." As for Meaden, he remains confident that his basic concept of a circles-swirling vortex is corect and that his hypotheses will be confirmed in the near future.

Despite its entertainment value *Round in Circles* has some technical problems. Not only is there a wealth of unnecessary detail in the form of "he said," "she said," and "they said," which gets in the way of narrative flow, but its uneven pacing destroys the main story's dramatic impact. Fewer chapters and some judicious editing would have improved the book tremendously. But, all things considered, the book is a major contribution to the apparently never-ending story of human gullibility and "the will to believe."

Robert A. Baker is emeritus professor of psychology, University of Kentucky, and author of They Call It Hypnosis *and* Hidden Memories.

Too Much to Swallow

The Sorcerers' Crossing: A Woman's Journey. By Taisha Abelar. Viking Penguin, New York, 1992. 252 pp. Hardcover, $21.00.

BARBARA G. WALKER

If someone deliberately set out to write a mocking parody of mystical-journey literature, to make fun of popular trumpery like that of Carlos Castaneda or Lynn Andrews, that someone could hardly create a book any sillier than *The Sorcerers' Crossing*. Taisha Abelar would have you believe that a stranger named Clara came up to her one day in the Arizona desert and invited Abelar to follow her car for 400 miles into a remote Mexican wilderness to live in Clara's house, and that this our author immediately did.

On arrival at Clara's improbably huge and well-appointed house, Abelar is absolutely forbidden to enter any of the left side of the house, or any of the bedrooms except her own. She is also told that many other people live in the house, but at the moment they are all traveling in India, except for Clara herself.

Abelar swallows all this and goes on living in Clara's house for more than a year without ever looking into those forbidden areas; nor does she wonder much about the mysterious ways in which the house is kept clean and tidy and meals regularly appear, apparently without human intervention. Clara herself seems to do little about the house. Often she disappears for days or weeks at a time, leaving her guest alone. No one ever seems to do laundry or drive a car or shop for anything; no service people come or go; no housekeepers or grounds attendants are to be seen. Abelar sometimes hears voicelike sounds in remote corridors, but she assumes it is only the wind.

What occupies Abelar through the long months in this unlikely situation is the sort of activity often described as a shamanic initiation. Under the decidedly ungentle guidance of self-appointed guru Clara, she is subjected to a kind of "teaching" consisting mostly of trickery, humiliation, and befuddlement. She gets a series of incomprehensible nonexplanations accompanied by scolding and insults; she is given pointless exercises to test endurance or induce ennui; she spends many hours daily sitting still and "recapitulating," which means remembering every event in her life up to this point. She says that she often falls asleep. In fact, she is so frequently either sleeping or fainting into extended periods of unconsciousness that the reader might well assume that she was routinely drugged into zombielike passivity. Certainly her incurious acquiescence is not the behavior of a normal human being. Her attitude is so generally limp and wimpy that her book will surely fail to engage the feminist audience it seems to aim for.

Other "teachers" finally show up, including a Mr. Abelar, a woman named Nelida, and another man, who first describes himself as a caretaker but turns out to be another shaman, named Emilito. These people take turns subjecting Abelar to various bizarre "training" routines, including an episode during which she is left for three days, strapped unconscious into a leather harness and hanging from

a tree. Eventually she wakes up and figures out how to let herself down, only to find a note telling her that everyone has gone away on an extended trip and that she is to stay alone, sleeping only in her hanging harness or in the tree house, which she fears. Her reaction to this abandonment is indifference, "as if something inside me had been turned off."

Her circuits aren't working any better when she looks for some diversion, and for the first time in a year and a half she decides to browse through the books in the library. Professing to have been "always fascinated" by astronomy, she tries "a thin book with plenty of pictures" on this subject; but as she begins to leaf through it, it soon puts her to sleep. On another occasion she describes herself as "not fond of books." Yet this unliterate person purports to be scholarly enough, according to her preface, to have acquired a Ph.D. in anthropology. No credentials are given anywhere in the book, nor any biographical information, not even her real name. The dustjacket describes her as an anonymous "member of an informal society of sorcerers."

By the end of the book, however, the reader has found no reason to think that Abelar will ever become a sorcerer, an anthropologist, or anything else. Though some hope is offered by her most recent teacher/tormentor, who promises that she will soon "cross over," she remains enveloped by "a cloud of fatigue and desperation" and overcome by "the strain of trying to understand the inconceivable." By this time the reader knows all too well how she feels.

What is really inconceivable is what profit anyone other than its publishers can derive from this book. Apparently, it was published only to feed the insatiable shamanic-journey genre market, where much wonder-tale fiction masquerades as autobiography and tries to convince us all that irrationality is a Higher Truth. Since the book is a product of the Castaneda school, with a foreword by Carlos himself, a cynic might even suppose that it really comes from Castaneda's prolific pen, with a female pseudonym to lure back feminine readers who have been defecting to the ranks of Lynn Andrews fans. Since metaphysical types are notoriously fickle in their allegiances, the author (Carlos or non-Carlos) of *The Sorcerers' Crossing* may hope to gain more followers from that ever-shifting group. This book, however, won't do it. Even the most credulous among us must have *some* limit to the amount of guff they can digest.

Barbara G. Walker is the author of 19 books, including The Skeptical Feminist.

STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION (Required by 39 U.S.C. 3685)

Date of filing: October 6, 1993. Title: The Skeptical Inquirer. Frequency of issue: Quarterly. Complete mailing address of known office of publication: 3965 Rensch Road, P.O. Box 703, Buffalo, NY 14226. Complete mailing address of the headquarters of general business offices of the publisher: 3965 Rensch Road, P.O. Box 703, Buffalo, NY 14226. Publisher: CSICOP, Inc. (Committee for the Scientific Investigation of Claims of the Paranormal), 3965 Rensch Road, P.O. Box 703, Buffalo, NY 14226. Editor: Kendrick Frazier, 3025 Palo Alto Dr., N.E., Albuquerque, NM 87111. Managing Editor: Doris Doyle, P.O. Box 703, Buffalo, NY 14226. Owner: CSICOP, Inc. (Committee for the Scientific Investigation of Claims of the Paranormal, Inc.), 3965 Rensch Road, P.O. Box 703, Buffalo, NY 14226. Known bondholders, mortgagees, and other security holders: None. Aver. no. copies of each issue during preceding 12 months: A. Total no. copies printed (net press run) 39,670. B. Paid and/or requested circulation (1) Sales through dealers and carriers, street vendors and counter sales 3,355; (2) Mail subscriptions 32,444. C. Total paid and/or requested circulation 35,799. D. Free distribution by mail, carrier, or other means, samples, complimentary, and other free copies 2,463. E. Total distribution (sum of C and D) 38,262. F. Copies not distributed (1) Office use, left over, unaccounted, spoiled after printing 1,408; (2) Return from news agents 0. G. Total (Sum of E, F 1 and 2) 39,670. Actual no. copies of single issue published nearest filing date: A. Total no. copies printed (net press run) 40,000. B. Paid and/or requested circulation (1) Sales through dealers and carriers, street vendors and counter sales 3,700; (2) Mail subscriptions 32,386. C. Total paid and/or requested circulation 36,086. D. Free distribution by mail, carrier, or other means, samples, complimentary, and other free copies 2,492. E. Total distribution (Sum of C and D) 38,578. F. Copies not distributed (1) Office use, left over, unaccounted, spoiled after printing 1,422; (2) Return from news agents 0. G. Total (Sum of E, F 1 and 2) 40,000.

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A Beginner's Guide to Scientific Method. Stephen S. Carey. Wadsworth Publishing Co., Belmont, CA 94002. 1994. 124 pp. $14.25, paperback. Excellent, brief, nontechnical introduction to the basic methods underlying all good scientific research. Divided into sections on Science, Testing Explanations, Establishing Causal Links, Extraordinary Claims and Anecdotal Evidence, and Fallacies in the Name of Science.

Carlos Castaneda, Academic Opportunism and the Psychedelic Sixties. Jay Courtney Fikes. Mellenia Press, 207-1005 View St., Victoria, B.C., Canada V8V 3L7. 1993. 285 pp. $19.95, paperback. A worthy new critical examination of Carlos Castaneda's works and other abuses and distortions of ethnographic practices in the United States and Mexico by New Age guru seekers and unscrupulous enterprisers both within and outside of academia. Places the sensationalism of Native American religious practices in the context of the psychedelic movement of the 1960s and 1970s.

Dying to Live. Susan Blackmore. Prometheus Books, 59 John Glenn Drive, Amherst, NY 14228-2197. 1993. 291 pp. $23.95, hardcover. A valuable, evenhanded review of near-death experiences and the process of dying. Based on interviews and case histories and informed by recent findings in psychology, biology, and medicine. Presents clear physical explanations for the changes that take place in the brain and awareness during death.

Encyclopedia of Hoaxes. Gordon Stein. Gale Research Inc., 835 Penobscot Bldg., Detroit, MI 48226-4094. 1993. 347 pp. $49.95, hardcover. New reference work brings together in one place many of history's most interesting deceptions. Divided into 27 subject chapters (anthropology, archaeology, history, journalism, literature, psychology, science, etc.) covering nearly 150 incidents. Entries within chapters include background information, how the hoax was played out, how it was discovered, and any ramifications. Includes 80 illustrations, index, and bibliography.

The Evolutionary Tales. Ronald L. Ecker. North Bridge Books, P.O. Box 1359, Palatka, FL 32178. 1993. 212 pp. $10.00, paperback. Subtitled "Rhyme and Reason on Creation/Evolution, with Apologies to Chaucer and Darwin." Ecker, author of *The Dictionary of Science and Creationism*, here presents evolutionary theory and the pseudoscientific nature of "creation science" by a recasting (complete with rhymed iambic pentameter verse) of *Canterbury Tales*. The travelers, mostly scientists, go off on a pilgrimage to a creationist seminar in Tennessee. Ecker hopes it will interest readers in further study of science in general and the creation/evolution controversy in particular.

Great Mysteries of the West. Ferenc Morton Szasz, Editor. Fulcrum Pub-

lishing, 350 Indiana St., Suite 350, Golden, CO 80401. 1993. 266 pp. $19.95, paperback. Descriptions and evaluations of a variety of popular mysteries in the western United States. Sections include Creatures (Sasquatch, Ogopogo, etc.), the Native American World (rock art, the "vanishing" Anasazi, etc.), Unexplained Phenomena (the Roswell Incident is the main one here), Legends and Lost Treasures and Mines. The editor is a professor of history at the University of New Mexico and most of the authors are academics.

The Healing Revelations of Mary Baker Eddy. Martin Gardner. Prometheus Books. 1993. 255 pp. $24.95, hardcover. A new examination of Mary Baker Eddy and what she called her "discovery" of Christian Science. An intriguing look at another example of, as Gardner puts it, "the ease with which strong, charismatic personalities can fabricate a set of beliefs that seem outrageous to outsiders, yet will win the allegiance of millions."

Magic or Medicine? Dr. Robert Buckman and Karl Sabbagh. Macmillan London, Cavaye Place, London SW10 9PG. 1993. 286 pp., hardcover. This investigation into healing explores the range of medical treatments, conventional and alternative, available today. Examines the reasons behind the major shift away from conventional medicine and what it is that attracts people to homeopathy, acupuncture, kinesiology, and other forms of complementary medicine. This is a book based on the television series of the same name.

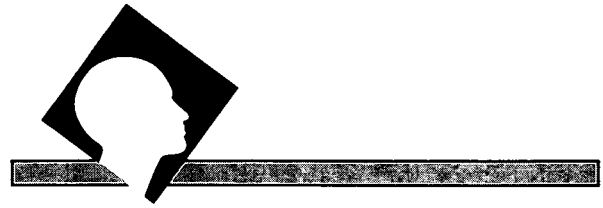
Sampling Inner Experience in Disturbed Affect. Russell T. Hurlburt. Plenum Press, 233 Spring St., New York, NY 10013. 1993. 250 pp. $42.50, hardcover. The second volume in which the author, a psychologist, reports the results of his research into the nature of human inner experience. Hurlburt has combined inventiveness and creativity with a scientific viewpoint and statistics to originate a means of examining what it's like to be human "from the inside."

Selling Satan. Mike Hertenstein and Jon Trott. Cornerstone Press, 939 W. Wildon Ave., Suite 202C, Chicago, IL 60640. 1993. 476 pp. $12.95, paperback. An exposé by two evangelical journalists of Mike Warnke, who for 20 years claimed he had been leader of a 1,500-member satanic cult and, as author of *The Satan Seller*, helped spread the idea of a widespread satanic conspiracy. This is an expanded version of their original investigation published in 1992 in *Cornerstone* magazine, which punctured gaping holes in Warnke's claims. That led to Hertenstein and Trott being labeled the "Woodward and Bernstein of Christian journalism."

The Tree of Life. Ellen Jackson. Prometheus Books. 1993. 40 pp. $14.95, hardcover. A children's book written to acquaint youngsters with the continuing process of natural evolution. Celebrates the marvels of evolution in a way young children can appreciate. Illustrated by Judeanne Winter.

—*Kendrick Frazier*

Articles Of Note



Bower, Bruce. "Sudden Recall" and "The Survivor Syndrome." *Science News*, September 18, 1993, pp. 184-186, and September 25, 1993, pp. 202-204. Two-article series reports even-handedly on the debate among psychologists over adult memories of child abuse.

Bynum, Joyce. "Poltergeists—A Phenomenon Worthy of Serious Study." *Etc.* 50 (2): 221-226, Summer 1993. A brief history of poltergeist studies, ending with the proposal that "psychophysical" activities may be the source.

Chiao, Raymond Y., Paul G. Kwiat, and Aephraim M. Steinberg. "Faster than Light?" *Scientific American*, August 1993, pp. 52-60. Experiments in quantum optics show that two distant events can influence each other faster than any signal could have traveled between them. Nevertheless, faster-than-light communication still seems impossible and the theory of relativity remains neatly intact.

Dawkins, Richard. "Viruses of the Mind." *Free Inquiry*, Summer 1993, pp. 34-41. Text of the author's keynote address at 1992 CSICOP conference.

Dewsbury, Donald A. "On Publishing Controversy: Norman F. Maier and the Genesis of Seizures." *American Psychologist*, 48(8): 869-877, August 1993. Maier's experiments on rats challenged the prevailing psychological theory in the 1930s. The resulting criticism caused him to change fields. Dewsbury argues that the journal editor could have made a difference by publishing comments and rebuttal.

Diamond, John. "Something for the Weekend." *Times Magazine* (London), June 26, 1993. The columnist muses on the willingness of people, including some reporters, to accept supernatural explanations for fortune-telling, when simpler ones are available.

French, Christopher C. "Experience of Ostensibly Paranormal Events Is Normal: A Psychologist Replies to Greeley." *Journal of the American Society for Psychical Research*, 87: 193-198, April 1993. Argues that while it is true that many people report experiences that they interpret as paranormal and that belief in the paranormal is widespread, it is important to recognize that these "ostensible experiences" may derive from several universal cognitive biases within our information-processing systems.

Hansen, George P. "The Research With B.D. and the Legacy of Magical Ignorance." *Journal of Parapsychology*, 56: 308-333, December 1992. Critical re-examination of research by Kanthamani and Kelly with special subject Bill Delmore (B.D.), which produced extremely high scores and received wide acclaim in the parapsychology literature. Shows how the formal tests were vulnerable to cheating in many ways. Contends that these and other technical difficulties with the tests are symptomatic of deeper difficulties. In particular, a few prominent parapsychologists have been vocally pro-

moting research involving known tricksters, and these researchers have no knowledge of conjuring. Hansen says priorities set by editors, educators, and research managers need to be re-evaluated and parapsychologists need to become more familiar with conjuring.

Horgan, John. "The Worst Enemy of Science." *Scientific American*, May 1993, pp. 36-37. Lively profile of Paul K. Feyerabend, who insinuates that there is no logic to science, that scientists develop and adhere to theories for what are ultimately subjective and irrational reasons, and that there are no objective standards by which to establish truth.

Nicholson, Richard S. "Postmodernism." *Science*, 261: 143, July 9, 1993. Editorial about prevalence of anti-science attitudes throughout society. Asks, What is the appropriate response?

Parot, Françoise. "Psychology Experiments: Spiritism at the Sorbonne." *Journal of the History of Behavioral Sciences*, 29 (1): 23-28, January 1993. In the early 1920s French scientists studied spirit mediums under scientifically controlled conditions. Results were predictably meager.

Porteous, Skipp. "Pseudo-Science at CBS. Biblical Specials Trade Credibility for Ratings." *Extra!* (Fairness & Accuracy in Reporting, New York City), July/August 1993, p. 17. Complaint against CBS for uncritically airing a series of prime-time specials claimed to present "startling and surprising evidence" to validate biblical stories viewed by many as myths.

Rogers, Martha, and Kirk H. Smith. "Public Perceptions of Subliminal Advertising." *Journal of Advertising Research*, 33 (2): 10-18, March/April 1993. The majority of Americans surveyed had heard of subliminal advertising, and the majority of that group believed it is being used and is effective. The authors see this as a case of boring facts not catching up with sensational claims.

Sandberg, Jared. "When a Penny Falls from Heaven, Can It Kill a Pedestrian?" *Wall Street Journal*, September 22, 1993, p. 1. Light feature about urban legends and folklore, focusing on Charles Lasner, a Queens, New York, computer consultant who uses an Internet computer network and the news-group name "alt.folklore.urban" (AFU, for short) to sift fact from fallacy and disseminate findings.

Stephan, Karl D. "N Rays, Super-Dielectrics, and Microwaves Faster than Light: Improbable Discoveries in Electromagnetics." *IEEE Antennas and Propagation*, 35 (3): 13-18, June 1993. University of Massachusetts electrical engineer describes two historical incidents of false "discoveries" by sincere, reputable researchers in electromagnetics. Concludes by describing an ongoing controversy surrounding recent claims by Thomas Ishii (Marquette University) that, under certain conditions, microwave signals can travel faster than the speed of light in a vacuum. Unlike the earlier two cases, no one has yet visited in the claimant's laboratory to see first-hand what is really taking place.

Young, James Harvey. "Sex Fraud." *Pharmacy in History*, 35 (2): 65-69, 1993. A brief review of fraudulent medicines and quack cures dealing with sexual problems from the eighteenth through the twentieth centuries.

—*Kendrick Frazier and Robert Lopresti*

Forum

Being in Philadelphia

RALPH ESTLING

Justin McQuaid, who attends Concord Elementary School in Glen Mills, Pennsylvania, writes to the *Philadelphia Inquirer* (July 4) to ask which is smarter: Albert Einstein or an Apple IIGS computer?

It's a fair question, demanding a fair answer and no hanging about. The *Philadelphia Inquirer* hangs about a bit, saying that there are, well, different *sorts* of smartness, and so it all depends. I personally think more highly of Einstein's smartness, but I don't think that proves much, except that maybe I'm a human chauvinist pig, which doesn't sound too good in these earnest days of political correctness. What say you, stranger?

The fact is, there are a lot of very intelligent humans arguing over the answer to Justin's question, all of whom are absolutely convinced their answer is the right one. Every side (there are more than just two) possesses the same endearing characteristics, such as omniscience. It's particularly endearing when the omniscience of one side comes into conflict with the omnisciences of some other side, so that you have two, and sometimes five or six, contending omnisciences battling it out. But a little omniscience goes a long way.

What consensus there is—and there isn't much—is that, for the moment, humans have the edge on computers, but some humans think this may not always be so, however we define smartness. Roger Penrose, who is a very smart human, thinks it *will* always be so, but there are smart humans on the other sides.

Of course, if a computer is fed wrong information it will produce wrong answers. Garbage in, garbage out—we all know that. But this is true for most people. If they're taught errors and lies, then errors and lies is what they'll believe. At least the vast majority will. A few may not, so maybe these few can be counted as superior to any computer. But the majority don't fit into this critical, questioning category; the majority can't be bothered to ask questions, which, when you come down to it, is largely what intelligence consists of. So, when we talk of "the human race" being smarter than computers, we had better bear this quantitative aspect in mind. After all, Einstein's intelligence, that is to say, his inclination to ask questions about things most people *knew* to be so, wasn't all that typical of the human race's. It's like that claim that human runners can outrun a racehorse over a short and long distance (although not over a middle distance). What's really meant is that maybe one in a million humans can outrun a racehorse, which isn't quite the same thing as the generalization. We are right to be leery of generalizations, but we are making them all

the time. I'm doing it right now. It can't be helped.

The trouble with generalizations is that we shouldn't live with them and we can't live without them. Science couldn't exist without them. *We* couldn't. Einstein made generalizations all the time, about God not playing dice, about the universe being comprehensible, about reality being determinate. We have his *General* Theory of Relativity, which generalizes from his Special Theory. As splendid as the Special Theory is, it's not all that practical because, after all, things don't move at a steady rate, generally speaking—not even light, not when it nears big, massive things like stars and black holes. One must generalize to make sense of existence, the way things are, when you really get down to it.

Which is where the trouble starts. When we deal with details, particulars, individual cases, we're, generally speaking, on safe ground, always provided of course that we keep our wits about us. But when, as we must, we move away from the particular and out toward the vast, troubling universe, we're heading for headaches, and worse. Physicists assure us it's the other way round: It's the generalized situation that's easy; all those molecules in the box can be understood. As long as we take a general view, we can work things out beautifully on a statistical basis, bearing *all* those molecules in mind and not just this one or that one. An insurance broker takes the same view when it comes to people. Aggregates are easy to work with. You always know what they'll do; all you have to do is look at the actuarial tables, the probabilities that work for the bunch, but rarely, if ever, for Joe Blow.

And that's precisely where the trouble is. Most of us aren't physicists or insurance accountants, and even if we are we still must make generalizations that have nothing to do with molecules and the life expectancy of aggregate humans and yet have to do with what's probable and what isn't. Like claims of the paranormal.

"Scientists are among the most prejudiced, biased, partisan people who exist, and that is precisely what they should be."

Almost all scientists dismiss the paranormal out of hand, and this strikes many fair-minded individuals as unfair, as well as unscientific. After all, aren't scientists supposed to be deeply interested in finding answers to *all* questions, with minds wide open, ready to test this hypothesis and that one and not come to any conclusion until they do? Isn't *that* the way scientists are supposed to be? Unprejudiced.

No. Scientists are among the most prejudiced, biased, partisan people who exist, and that is precisely what they should be. They are prejudiced in favor of rationality and against irrationality, and they don't go around proving it again and again each time a spoon is bent, a UFO sighted, or a picture of an arrow or a square or wavy lines rightly identified by the person in the other room. What they do is generalize from what is known to be the case. Gravitation is known to be the case, and so it isn't necessary to drop a hundred or a hundred billion objects to see. It is possible that all the molecules of air will suddenly and inexplicably move so that they're all directly beneath the dropped object and support it motionless in the air, even push it upward, but the chances of this happening are not good. In fact,

"Science is otherwise. Its laws are strict and dogmatic and not passed by an Act of Congress. . . ."

the chances are so poor that we can be reasonably certain that such a thing has never happened in the history of the universe, and that it never will—unless Fred Hoyle and the steady-staters are right and the universe is infinite and eternal. With infinity and eternity all bets are off; that is the nature of infinite and eternal things. It's hard to generalize about them.

But if we believe in a universe that has its limits in time and in space, then we must generalize about what is and what isn't probable. We don't examine each particular individual claim of very high improbability. We take it for granted that something is wrong with it—as David Hume surmised about miracles—forget it, and get on with other things. From the general all particulars must follow. If someone says that a *particular* particular once didn't—I witnessed a man dropping a bowling ball and saw it, actually *saw* it, float off in the direction of Philadelphia—his claim is not investigated, it is ignored, and a million voices will be raised in unison telling us how *unfair* this is, and how *un*scientific! Hey, isn't there a committee somewhere that scientifically *investigates* such claims? Don't we *need* such a committee, desperately, urgently, ineluctably? Don't we *require* unbiased, open-minded *scientists* to look *into* these extraordinary matters and report back to the rest of us what they discovered? Yes, of *course* we do! How could *science* be otherwise?

Science *is* otherwise. Its laws are strict and dogmatic and not passed by an Act of Congress or subject to judicial review by the Supreme Court or decided by propositions that the voters go to the polls over in nice, democratic fashion. Humans emerged from ape-like ancestors through the medium of natural selection. That is what happened. It is what happened whether the sovereign state of Louisiana likes it or not. It is what happened whether *anyone* likes it or not. And it is this terrible *factuality* in science, this attendance to what did actually occur, and not what we would *like* to have had occur, that drives many fair-minded people who think they are rational to get very angry at science, call it a new religion, doctrinaire, bigoted, a threat to us all, with its laws and rules and edicts. How unlike the homelife of our own dear philosophies!

We are mightily concerned about answers. We are not nearly so interested in questions.

In his *Hitchhiker's Guide to the Galaxy*, Douglas Adams's megacomputer Deep Thought comes up with the answer (after six million years) to the riddle of Life, the Universe, and Everything. The answer, as we all now know, is "42." That doesn't seem to tell us much. I suspect that Adams is saying that answers *don't* generally tell us much, answers aren't really all that important. Questions are what are important.

We seem to have wandered a long way from little Justin McQuaid's question to the *Philadelphia Inquirer*. And it is the *question* that's important; the answer seems—well, to depend. Justin is concerned with the particular case, with Einstein and the Apple IIGS, not with people and computers, which is what scientists are concerned with. Scientists might start out with a particular case, but they're not really interested in it. What interests them is the general pattern, because that is how things are in a rational world,

ruled by rules and not happenstance and miracle. Dogmatic? Yes, of course. Prejudiced? Absolutely. Blinkered? No doubt about it. Unfair? Well, yes, I suppose you could call it unfair if by "fair" you mean having entirely open minds to all things and all possibilities, including the most unlikely, and having to prove over and over again that what is highly unlikely in principle is highly unlikely in practice.

But above and beyond and beneath all this is the scientific idea (but not Justin's) that it's *questions* that matter. Answers, when you come right down to it, tend to be . . . a trifle *dull*, perhaps?

And so it turns out that the world is ruled by what generally is the case. This answer is pretty unexciting, like most answers, when compared with the questions that inspired them, and lots of people get cranky and irritable when they realize this. If the world is not ruled by what is generally the case, "generally" here meaning what has always been the case since the universe began and is very likely to be the case until the universe ends, then the world is ruled by chaos, tinkered with by the gods. I don't think such a world is very possible or—opinion now—very desirable.

Frankly, if such a mindless, irrational, lunatic universe existed, or could exist, I'd rather be in Philadelphia.

Ralph Estling writes from Ilminster, Somerset, England.

Tyrannosaurus Hex

ROBERT J. PARK

Some scientists were so concerned by how their profession was depicted in *Jurassic Park* that they proposed a public-relations campaign to counter the film's "anti-science" message. Pshaw! They've fingered the wrong flick. The threat to science, if there is one, comes from films like *Dracula*, in which evil is warded off with religious icons. A little science, even implausible science, is a welcome relief from the superstitious twaddle Hollywood usually gives us.

Of course it's not just Hollywood. One in four Americans consult the morning paper for their horoscope before they read the headlines, according to one poll. The same poll found that a third believe they have been in touch with a dead relative. Polls conducted in Britain and Germany found that substantial majorities believe in good-luck charms and fortune-tellers.

In the former Soviet Union, such things were suppressed by the state. But now that they are liberated from authoritarian dogma, the people are squandering their newfound freedom of thought on the same sort of preposterous nonsense that afflicts the West; astrologers, psychics, palm readers, and faith healers seem to have popped up on every street corner in Moscow. Repression by the state is being replaced by the shackles of superstition.

What connects these superstitions is a belief that humans occupy a position of central importance in the universe. Throughout history, scientific ideas that diminish this conceit—the heliocentric solar system of Copernicus, Darwinian evolution, and the Big Bang—have aroused fierce resistance.

Sixty-eight years have passed since the Scopes trial. In that time, the genetic code has been broken, and our

kinship to the apes is now quantifiable. Only about 0.4 percent of human DNA differs from that of chimps. If it were any closer, we would have to offer the chimpanzees a seat in the UN. Yet fundamentalists still successfully oppose the teaching of evolution in our public schools.

Brought up in an environment in which religious claims are never challenged, many college students surrender their free will to religious cults. The Branch Davidians in Waco, Texas, after all, were not just semiliterate rustics. Most were college educated, some with advanced degrees: a Harvard-trained lawyer, a computer consultant, an accountant. But their education had failed to instill in them even the most rudimentary notion of critical thought. They had succumbed to the insidious teaching that belief is a virtue. Their faith was being tested, and they met the test.

Nor is it just fundamentalists who reject the idea of a rational, understandable universe. After all, at a time when telescopes peer to the very edge of the universe and giant accelerators prepared to recreate the conditions at the beginning of time, most people find the old myths of creation unsatisfying. In their place, however, the New Age movement, with its peculiar blend of antirational mysticism and symbols borrowed from science, embraces psychokinesis, telepathy, channeling, pyramid power, UFOs, cold fusion, and other modern superstitious beliefs.

Even a Ph.D. in physics, I should warn you, is no inoculation against irrational beliefs. This past summer, an organization calling itself the Institute of Science, Technology, and Public Policy, headed by John Hagelin, a Harvard-trained particle theorist, launched a two-month, $4-million experiment to reduce crime in Washington, D.C. Hagelin explained that a thousand trained experts would generate a powerful antiviolence field by meditating in unison. The field would not only reduce crime by spreading tranquility throughout the city but also make President Clinton more effective in running the nation.

You will not be at all surprised to learn that the expert meditators, all followers of the Maharishi Mahesh Yogi, declared the experiment to have been an enormous success—experimental proof of the creation of an anticrime field by group meditation. They seemed genuinely convinced that they had succeeded, even though the murder rate in Washington soared to a record level during the period of the experiment. The murders, they cheerfully explained, were less brutal. They requested $5 million in public funds to continue meditating.

How are we to account for such widespread nuttiness? Is it something indelibly coded into our DNA? Maybe. Without getting into questions of technical feasibility, imagine using preserved DNA to clone one of our Stone Age ancestors, instead of tyrannosaurs. The Cro-Magnons lived in the Pleistocene epoch some 30,000 years before the dawn of civilization. Would a Cro-Magnon clone be some savage brute that could get loose and terrorize society? I'm afraid "Pleistocene Park" wouldn't be that exciting; a Cro-Magnon reared in today's society would be indistinguishable from the rest of us.

Evolution, after all, is a very slow business, it cannot keep up with today's pace of change. That change comes about because language has allowed us to accumulate information over the millennia. The inescapable truth is that we are pretty much unchanged from savages that survived in the Pleistocene forests by eating grubs off the bottom of rotten logs. Perhaps in that primitive world

there was some evolutionary advantage to the unquestioning acceptance of authority.

It is remarkable that creatures who have evolved to find food and avoid predators should be capable of writing sonnets and doing integral calculus—much less operating a VCR. But no matter how clever we are at doing these things, the modern world of jet travel and computers bears little resemblance to the primitive world in which we evolved over hundreds of thousands of years. The wonder is not that some of us act strangely at times, but that we cope at all in today's alien world.

And it's only going to get worse. Unlike our nearly stagnant DNA, the society in which we live will change even more rapidly as we leave the century of physics and enter the century of biology. Compared to the supernatural nincompoopery that gushes forth from Hollywood, cloning *Tyrannosaurus rex* doesn't seem so farfetched. If there is a concern raised by *Jurassic Park*, it is not that the new biology will create monsters, but that its enormous power will be wasted on such trivial undertakings.

Robert L. Park is professor of physics at the University of Maryland and director of the Washington office of the American Physical Society. This is a slightly expanded version of a column published in the New York Times.

Trying to Understand Traditional Chinese Medicine

PETER HUSTON

Recently the Public Broadcasting Service aired a five-part television special, "Healing and the Mind," produced by the highly respected broadcast journalist Bill Moyers. Overall, I think it was an excellent series, covering aspects of how science is beginning to explore the ways in which our minds and feelings affect our health.

Curiously, the first program of the series was not on modern medicine at all. Titled "The Mystery of Chi," it dealt with the ways in which Traditional Chinese Medicine (TCM) has been used in the People's Republic of China. The hour-long program introduced TCM, showed how it was widely accepted and used even today, and then proceeded to delve into Chi and Chi theory. In doing so it gave a rather credulous account of some of the more surprising claims regarding the alleged powers of Chi and Chi kung (also spelled *Qi* and *Qigong*), the art of manipulating Chi.

First, why do the Chinese continue to practice TCM? The answer given was a simple one: "Because for the Chinese it obviously works." This is only partially true. China is a very large, very poor country, with a people, a history, and conditions that are very different from our own. Traditionally the Chinese had been rather self-assured about having a superior level of culture when compared with their neighbors. Therefore when it became obvious over the past 150 years that there were many apsects of their civilization that were inferior to what the West had to offer (for instance, military science) it caused what would be something of

an understatement to describe as a national trauma. Combining East and West has never been easy, and it is even more difficult in a tradition-oriented culture like China's.

In the eyes of many Chinese, TCM is part of their national identity and tradition. To abandon it and accept another form of medicine would be to question or deny this identity, an almost sacrilegious act in the eyes of some Chinese.

Second, there's the matter of economics and the unique medical situation in much of Asia today. Economically, it is difficult to replace a traditional health system that serves such a large population with a different system, even if change is desired by the people it serves (and in China it is only partially desired). When China became a republic in 1912, the government proceeded to embark on a naively ambitious program to modernize the country. It considered banning TCM, but decided against it, since to do so would be to deprive the majority of the population of any sort of health care. When Mao and the Communists took over in 1949, they had no desire to turn China into a carbon copy of the West and so strove to present TCM as an alternative to Western medicine.

Furthermore, Western-style medicine did not evolve naturally in Asia. It was imported piece by piece, medical school by medical school, and at times, doctor by doctor, This has led to uneven medical systems, and often TCM has been quite useful in filling in the gaps.

For instance, if a returning Chinese medical student was quite advanced in cardiology and able to perform, say, a particularly new and impressive sort of open heart surgery, he or she would be greeted with respect and great rewards in terms of money, prestige, and career opportunities. On the other hand, if a student returned as a general practitioner of superior skill and ability, but with no particularly impressive specialization, opportunities would be limited. If the rewards are small in a given area, then that aspect of medicine would be less developed. One result of this is a patchwork, ad-hoc feel to much of modern medicine outside the developed world. This becomes most obvious in a place like Taiwan. Although complex procedures, such as open heart surgery and the separation of siamese twins, are routinely practiced there, ambulances often lack rudimentary first-aid kits and qualified attendants.

Under these conditions, TCM can serve as a somewhat useful substitute for underdeveloped aspects of health care, such as mental health, general practice, and the treatment of non-threatening illnesses like digestive problems. TCM uses a wide variety of herbal and other treatments for emotional disturbances, and even if one were to take the extreme view that they have no validity whatsoever, the patient's belief that they do often produces a beneficial effect.

China is a big and complex country. Listening to various Westerners describe it is reminiscent of that old parable about the four blind men and the elephant. Each sees only a small part but thinks he understands the whole. As one looks at a given aspect of Chinese culture it must be seen in the proper context in order to be properly understood. Even then, it can become quite difficult to understand completely.

Peter Huston has a degree in Asian studies, has traveled throughout Asia and China, and lived in Taiwan for three years, where he taught English. He is currently working on a book, Beyond Chinese Mysticism.

HELP US DEFEND SKEPTICISM AGAINST HARASSING SUITS

CSICOP LEGAL DEFENSE FOUNDATION

In the Winter 1992 issue of the SKEPTICAL INQUIRER we outlined the difficulties that the Committee for the Scientific Investigation of Claims of the Paranormal is experiencing because of harassing lawsuits filed against skeptics.

We feel confident that these suits will eventually be dismissed. Still, we suspect that the lawsuits were brought for reasons other than the redress of alleged grievances.

For what do these suits mean? They mean that the pro-paranormalists think they have finally found a way to strike below the belt of scientists and skeptics. For years they have been unable to prove their claims of miraculous abilities. They've grown tired of hearing our challenges. Now they have turned to intimidation by lawsuit in an effort to silence their only persistent critics.

It doesn't necessarily matter if the plaintiff wins or loses the suit. Their purpose is to waste their opponents' resources and to intimidate and silence them—in effect, depriving individuals or organizations of their First Amendment rights.

We are by no means a wealthy organization, but we are not prepared to surrender our rights. *We have vowed to fight back.* To do so, we need your support. CSICOP has established the CSICOP Legal Defense Foundation. Its funds will be used to help pay the costs of existing lawsuits and any that may arise in the future, and to countersue when appropriate.

Don't allow the claim-mongers to destroy CSICOP (and the values of science and reason it steadfastly represents) through unjust and frivolous legal proceedings. Support the CSICOP Legal Defense Foundation today. It's the best way to blunt this frightening new weapon of the apostles of nonsense.

Yes, I want to help defend the rights of skeptics. Enclosed is my tax-deductible contribution of $ _____

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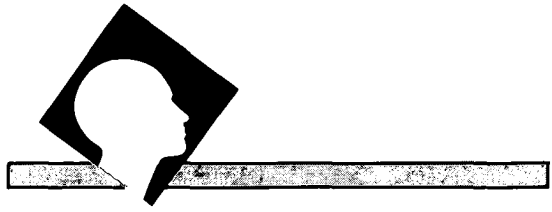
Letters to the Editor



The right brain

Thank you very much for running Fernando D. Saraví's article, "The Right Hemisphere: An Esoteric Closet?" (*SI*, Summer 1993). So many wild claims have been made for the left brain/right brain division of function that if I hadn't also read that the concept actually had some validity, I would have been convinced it was just more New Age hooey. This layman is glad to have had the whole thing finally explained from a rational standpoint.

Saraví refers to Barry Beyerstein's article in the Spring 1988 issue of *SI*, in which mention was made of the popular belief that we only use 10 percent of our brains. I've heard that old saw so often that I've had to wonder just where it came from. Beyerstein wrote that "origins of the 10-percent myth are obscure, but the concept was widely disseminated in courses like Dale Carnegie's and canonized in public utterances by no less a personage than Albert Einstein. I believe the error arose from misinterpretation of research in the 1930s showing that, with evolutionary advancement, a progressively smaller proportion of the brain is tied to strictly sensory or motor duties."

With all due respect to Beyerstein, I suspect there may be more to it than that. I found an advertisement for a self-improvement outfit called the Pelmam Institute, published in the 1929 edition of the *World Almanac*, which shows that the "10 percent" concept was current in the 1920s ("Scientists and psychologists tell us we use only about ten percent of our brain power.") Further, the chatty, familiar style of the ad copy suggests that the concept was expected to be familiar to the reader even then, as if it were already a well-known truism. A somewhat similar advertisement from the same edition of the *World Almanac*, this one for David V. Bush (who would be totally forgotten today but for the fact that H. P. Lovecraft ghostwrote some of his material), also speaks of vast untapped resources of the mind, though it doesn't specify an exact percentage.

So where did the 10-percent figure come from? I recall reading somewhere that it's a popular misunderstanding of the fact that at one time science only understood how 10 percent of the brain worked. A look at the "Brain" entry in the 1911 edition of the *Encyclopaedia Britannica* suggests this may be the case. The article describes efforts to map the brain (that is, what areas control which bodily functions). While certain regions of the brain were known to be associated with sight and others with smell and hearing, "'it is true that the greater part of the cortex remains still *terra incognita* unless we are content with mere descriptive features concerning its coarse anatomy."

Though no specific percentage is given, I can see how some misunderstanding of a statement that the function of 90 percent of the brain was unknown could give rise to the myth that only 10 percent was actually used. If any researcher has identified the source of the 10-percent myth more closely than that, I'd be glad to hear about it.

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Pathological science

I compliment Alan Cromer on his excellent update (*SI*, Summer 1993) to Irving Langmuir's classic work on "Pathological Science." However, since

he emphasizes Langmuir's confrontation with J. B. Rhine, I think it is only fair to point out that Rhine recounted this incident very differently. According to his *New Frontiers of the Mind* (New York: Farrar and Rinehart, 1937):

> Recently a distinguished chemist visited our laboratory and generously spent several hours arguing that there must be something basically wrong with our work—purely on general grounds. He had several times helped to expose error in his own field and felt that he knew the erroneous type of work by its general appearance, by certain symptoms. He did not see the particular snag in our case, but he knew it was there! (p. 133)

William J. Parry
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New York, N.Y.

Alan Cromer quotes some remarks of Irving Langmuir, who visited J. B. Rhine in 1934, to the effect that Rhine deceived himself into thinking that he had produced evidence for ESP by disregarding negative (below-chance) scores as being separately motivated. Rhine is thus accused of propagating "pathological science."

I am convinced that these remarks, which Langmuir made at a colloquium, some 20 years after his visit to Rhine, are entirely without foundation. In the first place, it is obvious from Rhine's *Extra-Sensory Perception* (1934) that he never based the case for ESP on the overall output of scores but rather on the fact that he had at the time some half-dozen or so individuals who were each able to score positively over a sufficient period as to yield astronomical odds against chance. In the second place, the problem of motivated negative scoring did not become an issue at the Duke Laboratory until after Gertrude Schmeidler and Robert McConnell had drawn attention to their findings showing that disbelievers ("goats") tended to score negatively while believers ("sheep") tended to score positively. See their *ESP and Personality Patterns 1953*.

Whatever may be the ultimate verdict on cold fusion (on which I hold no opinion beyond noting that experts still differ) there is no justification whatever for stigmatizing parapsychology as such as pathological science. Could it be, however, that Langmuir's comments, which Cromer accepts so uncritically, are an example of "pathological reporting"?

John Beloff
Department of Psychology
University of Edinburgh
Edinburgh, Scotland, U.K.

I was particularly interested in Alan Cromer's article on pathological science since it focuses, albeit indirectly, on the nature of belief.

The most important question for skeptics should be: What is it about human beings that accounts for their apparent willingness to allow a set belief to influence their perception of evidence bearing on that belief?

In discussing the controversy over cold fusion, Cromer quoted Kim Molvig as saying: "I am willing to be open-minded, but it's really inconceivable that there is anything there." He described this as an amusing comment, but I am afraid I missed the humor. I also missed the ambiguity Cromer found in the term *open-minded*. The *Oxford Illustrated Dictionary* (1975) defines the term as accessible to new ideas, unprejudiced, or undecided. What other meaning is there? Is it not the essential nature of skepticism to be open-minded, not adamantly negative as Glashow seems to be in his quoted statement regarding cold fusion: "I don't believe a word of it."

P. C. S. Hoaken, M.D.
Kingston, Ontario
Canada

Alan Cromer responds:

My update of Langmuir's description of pathological science includes a case from

modern science—the erroneous splitting of the A_2 peak—that resulted from the systematic selection of data that supported the outcome the researchers desired. Langmuir quotes Rhine, 37 years earlier, admitting the same ("Sometimes, to spite me, they make their scores purposely low"). Calling such low-scorers "goats" doesn't cure the pathology; it just makes the diagnosis easier.

Glashow's seven-word response to a reporter summarizes, as succinctly as is possible, his considerable knowledge of physics and of the many follies and pitfalls that beset scientific research. Should the evidence have proved him wrong, I'm sure he, and certainly I, would have gladly eaten a little humble pie in exchange for free and unlimited energy.

The textbook problem

Kevin Padian ("Improving Science Teaching: The Textbook Problem," *SI*, Summer 1993) says that our hearts are in the right place, but claims our proposal (*SI*, Winter 1993) for an experiential, "learning cycle" approach to science teaching "can have, at best, only limited success. . . ." The reason given is the sorry quality of current textbooks, and "improving them is the fastest, cheapest, and most effective way to improve learning standards for science in the United States."

Unfortunately, Padian does not seem to distinguish between standards for learning and how much is actually learned. To believe that making elementary-school science books more accurate would remedy the lack of interest in science and the deplorable level of critical thinking in our society verges on fantasy. The problem is not that our citizens confuse the concepts of force and energy because their textbooks blurred the distinction. The problem is that students report little interest in the content or procedures of science and show little ability to analyze issues or phenomena in a rational manner.

After a jeremiad on the use of "science instructors," not real scientists, as textbook authors, Padian dismisses the "science processes" that we had emphasized (observing, measuring, inferring, etc.) as only tools and not to be confused with ideas. He concludes that there will be little improvement until future authors (guided by *real* scientists) "center on the theories of science, rather than those of pedagogy."

We recognize this view as a simplistic, elitist argument commonly offered by "scientists." It ignores that, at the very least, quality of instructional materials, teacher competence, pedagogical strategies, and socio-polito-cultural forces need to be considered in any realistic plan to improve science education.

Wayne Rowe
Edmund A. Marek
University of Oklahoma
Norman, Okla.

I enjoyed Kevin Padian's article "Improving Science Teaching: The Textbook Problem" in the Summer 1993 issue.

Five years ago, I was hired to proofread a fifth-grade science textbook. I found only a few typos, but about a hundred technical errors. Most were minor (e.g., rounding errors in English to metric conversions), but some were more serious.

For example, the book correctly explained the difference between velocity and acceleration, and then gave six examples, five of which were wrong. As another example, the book said that once we have hydrogen fusion technology, we will have an "unlimited" supply of energy. No wonder politicians (and the public) can't deal with energy and environmental problems if they read that science will provide us with "unlimited" energy sources.

Although I finished the proofreading ahead of schedule and below budget, and thus gave the publishers an extra week to reword those sentences, they said that they didn't have the time and money to correct the serious technical errors.

And, of course, the company has never hired me again.

For another textbook horror story,

see *Surely You're Joking, Mr. Feynman!* In the book, physicist Richard Feynman recounts an incident in which a math textbook containing only blank pages was reviewed and given almost the same rating as its competitors.

Mark Gilkey
Palo Alto, Calif.

False Memory Syndrome

Re Martin Gardner's "The False Memory Syndrome" (*SI*, Summer 1993): Some traumas for some people clearly are repressed; other traumas for other people are clearly not repressed. Repressions may last for years.

In World War II, there were hundreds of documented cases of battlefield trauma-induced neuroses, characterized by symptoms appearing after the trauma and an inability to remember the trauma. Among helpful treatments used by the military and VA was a brief psychotherapy utilizing hypnosis or sodium pentothal interviews with the aim of quickly restoring a pre-traumatic level of functioning. Heightened suggestibility of the patients was not a problem, since other people knew what had happened.

Patients usually do try to get external confirmation of what they uncover insofar as it deals with externally observable events. With incest, however, the people best able to confirm or deny have a strong motive to lie if it is true.

Patients who accept false events as "real" memories (during badly conducted psychotherapy) do badly in their subsequent life. In psychoanalytic therapy this is not so much a problem; eventually the truth will be discovered as patient and therapist investigate and consider all possibilities. An honest psychotherapist may not know the truth for a long time; it is therapeutic for patients to learn to tolerate uncertainty and to consider that the reconstructed memory might or might not be true. But courts want the "truth" immediately.

Because of the social importance of memories the American Psychological Association has formed a task force to survey all we know about memory from both experimentation and clinical observations.

Bertram P. Karon, Professor
Department of Psychology
Michigan State University
East Lansing, Mich.

For a journal purportedly devoted to "scientific investigation of the paranormal," the inclusion of "The False Memory Syndrome" by Martin Gardner in your summer issue is disturbing, to say the least. This is an area in which I can speak from some knowledge: I am one of those "better trained" (will Harvard do?), "older" therapists, a writer of one book (*Second Childhood*, Norton, 1989) and many journal articles, and a teacher (of memory, among other subjects) on the post-graduate level. More important, however, I keep up with the literature: I would say, offhand, that I have read carefully at least 10 full-length professional books and 200 or more professional articles, as well as lay articles on the subject of delayed memory, including all of those cited in Gardner's contribution. In addition, just this year I have, in the interests of skepticism, curiosity, and open-mindedness, attended a lecture by John Mack, M.D. (surely an "older" Harvard psychiatrist, he of the UFOs) and a conference in which Pamela Freyd (she of the False Memory Syndrome Foundation) played a major part. I was greatly unimpressed—in fact, horrified—by both of them, each with an axe to grind that blinded them to consideration of real data. Unfortunately, I feel the same way about Gardner.

In the interests of brevity, I will focus on a fundamental point made by Gardner: "No one doubts that childhood sexual assaults occur, but *in almost every case the event is never forgotten*" (italics mine). This statement is in direct contradiction to evidence established in myriad serious studies. Let me refer him to just one small journal article that

summarizes a retrospective study of 200 admissions to an emergency room in which the admission records recorded sexual assault of female children under the age of 12 (Linda Meyer Williams, "Adult Memories of Childhood Abuse: Preliminary Findings from a Longitudinal Study," *The Advisor*, Summer 1992): 38 percent of 100 of those interviewed 17 years later did not remember the abuse or the hospitalization, which had been objectively documented. I have, myself, had clients who remembered childhood sexual abuse for the first time as adults, in or out of therapy, and, upon talking to the accused, were actually supported in their allegations by confessions and, sometimes, apologies. Still others located witnesses, or other unimpeachable evidence, such as records of a forgotten childbirth (due to forgotten incest) at a home for unwed mothers. Similar findings of corroborated accusations are documented in Herman's recent scholarly book, *Trauma and Recovery*. So, surely Gardner's assertion here is blatantly incorrect. In addition, his spurious comparison of delayed memory of sexual abuse to claims of "past lives" and UFO abductions puts a poor light on his intentions to be objective and fair-minded.

Marian Kaplun Shapiro, Ed.D.
Licensed Psychologist
Lexington, Mass.

Martin Gardner's column about the false memory syndrome (*SI*, Summer 1993) is an outstanding exposé of a pseudoscientific practice with devastating consequences for patients and their families. I commend Gardner for writing it and SKEPTICAL INQUIRER for publishing it.

Forrest M. Mims III
Seguin, Texas

Martin Gardner replies:

I have no objection to anything said by Bertram P. Karon. No one denies that traumatic memories can be repressed. The question is whether the thousands of such memories now being elicited by zealous, untrained, self-deceived therapists are genuine or are the product of dubious techniques abetted by sensational books read by the patients.

There are many ways memories of child abuse can be substantiated. A father capable of raping his four-year-old daughter betrays such psychotic behavior that it is almost impossible for there to be no other records of his mental illness. Wives, siblings, and other relatives seldom have reason to maintain a state of "denial." There can be confirming diaries and letters, or at times a full confession. When there is no evidence at all, coupled with vigorous denials by relatives and a history of the alleged victim's love and admiration for the alleged perpetrators, incalculable harm can be done both to parents and their innocent families by therapy-induced false memories.

Marian Kaplun Shapiro's doctorate is in education. This does not qualify her to practice psychiatry. She is a self-proclaimed hypnotherapist.

Her praise of Judith Herman's book is misplaced. Herman did indeed find that in 53 cases of incest survivors, 39 found corroborative evidence. This seems impressive until you learn that 39 survivors had no loss of memory to begin with. "It wouldn't be surprising," said University of Arizona psychologist John Kihlstrom in a recent lecture, "if these individuals were able to validate their memories. Confirmation of abuse is not the same as confirmation of repressed memories."

In Herman's study, patients with nonrepressed memories reported sex abuse when they were eight or older. Those who recalled abuse only after prolonged therapy reported an average abuse age of 4 to 5 years. Why were these memories pushed so far back? Because, Kihlstrom suggests, they had to push them back to a time when they couldn't remember anything else.

Shapiro objects to my comparing repressed memories of child sex abuse with similar memories of Satanic rituals, UFO abductions, and past incarnations. But techniques for evoking such memories are exactly the same in all four areas. In the case of Satanic cult memories, the therapy

is just as widespread.

I urge readers to check the sensational two-part article "Remembering Satan," by Lawrence Wright, in the New Yorker *(May 17 and 24, 1993), Leslie Bennetts' article in* Vanity Fair *(June 1993), Gayle Hanson's article in* Insight *(May 24, 1993), and Claire Safran's piece in* McCall's *(June 1993). Better still, write for literature to the False Memory Syndrome Foundation, 3401 Market Street, Philadelphia, PA 19104. This rapidly growing organization, supported by eminent psychiatrists, was formed in 1993 to combat the greatest witch hunt and mental health scandal of this half-century.*

Make use of television

In your Summer 1993 issue, Paul Kurtz asks in his article "Exploring the Television Wasteland," "Is there a remedy for the continued purveyance of the paranormal without scientific dissent?" I think the only effective remedy is to fight fire with fire. Commercial television reaches many millions of people. The SKEPTICAL INQUIRER, along with CSICOP and its members' books, lectures, seminars, and conferences, plus the efforts of like-minded local and regional skeptics organizations, reach perhaps about 100,000 people, a drop in the bucket in comparison. The overwhelming majority of Americans don't even know there is a dissenting viewpoint derived from objective and impartial inquiry.

CSICOP should host a television program similar to James Randi's "Exploring Psychic Powers—Live," which aired on June 7, 1989. To keep public interest in the show, a variety of pseudosciences should be covered and straight debunking should be intermixed with investigative reporting (here emphasizing methodologies and investigative skills average people can use) and "attacks" on methods used in other programs that uncritically accept pseudoscience. Some topics that are valid in reality, like the ability to firewalk or animals' recognizing and reacting to like animals on TV, should be included. This will help prevent an automatic expectation that the phenomenon in question is going to be debunked. The most entertaining and capable people should be found to be MCs.

The public's willing and uncritical acceptance of pseudoscience has its roots in other areas besides the mass media, particularly education, to which Kevin Padian alluded in his article in the same issue. This woolly thinking crosses over into many other areas, such as political and economic decisions. A CSICOP television show won't solve the whole problem but it would be a big step in the right direction.

Ron Ebert
Dept. of Physics
University of California
Riverside, Calif.

The experience of Paul Kurtz with the "Shirley" show is not uncommon. Talk shows consistently portray abnormal behavior as appealing and normal behavior as pathological. Deviation from the "abnorm-," as it were, is perceived as closed-mindedness, or bigotry, or whatever other convenient label happens to come to mind.

However, all that is televised is not trash. For example, "Square One T.V.," a show on PBS, has twice aired specials that demonstrate how swindlers can use math to validate their claims to paranormal powers. In one show, the swindler sent letters to many people predicting the results of an event with two possible outcomes—half the letters predicted one result, and half the letters predicted the other. The swindler repeated this process a number of times, always sending the new batch of predictions to the people who previously received the correct prediction. In this way, the pool was finally reduced to a small number of people who were easy prey for a swindle, and the swindler had "proof" of his paranormal powers of prediction. Let us also not forget "Mr. Wizard," "Newton's Apple," "Beakman's World," "National Geographic," and many other productions devoted to

showing and explaining the world to the viewing public.

Television is currently going through the same evolution the printing press did. There are issues of government control, uses by radical or fringe elements of society, pornography, censorship. But there is also the quick and easy display of information, access to information by a greater majority of the population (in the vernacular, even), and a more effective exchange of ideas.

Edwin Heller
North Waterboro, Maine

Galileo and geocentrism

In Gabriel Seabrook's interview with the "Star Hustler" (*SI*, Summer 1993), Jack Horkheimer states: "In 1610, Galileo saw the moons of Jupiter through a telescope and proved that we are not a geocentric system." This observation showed that Jupiter has moons, not that the earth is not at the center of the universe. Similarly, Galileo's observation of the phases of Venus showed that Venus orbits the sun—not that the earth does. If SKEPTICAL INQUIRER had been around in 1610, it may have pointed out that Galileo's observations were suggestive of a heliocentric system but did not prove it. Conclusive observations were not available until James Bradley discovered the aberration of starlight in 1729.

Richard Rees
Yerkes Observatory
Williams Bay, Wis.

The IQ debate

Thank you for printing Lee Loevinger's review of Daniel Seligman's important book, *A Question of Intelligence: The IQ Debate in America* (Summer 1993). As a politically conservative skeptic, I have had to bite my tongue sometimes over your writers' snide asides about Ronald Reagan and Dan Quayle, so it was refreshing to see you take on the "politically correct" left on the issue of the heredity of intelligence.

The fact that the most important issue of our day gets no bigger play than a book review toward the back of your small-circulation publication, and that speaking the truth about it can wreck a person's career and life, in what is supposed to be the world's most free society, ought to trouble every thinking person.

It is remarkable that psychometricians who know very well that IQ is a real, measurable phenomenon, and that it is to a large extent inherited, don't dare say so in an arena where the general public might hear them. In no other branch of science today is knowledge suppressed by intimidation; theirs is reminiscent of the work of astronomers in the Middle Ages who knew that the earth circled the sun but feared to say so for fear of excommunication and public opprobrium.

John Penninger
Canoga Park, Calif.

In advocating treating persons as individuals and not members of groups, Lee Loevinger minimizes the social problems laid out by Daniel Seligman's assessment of mental testing. If racial or ethnic group averages in IQ differ by as much as one standard deviation, then only 16 percent of the members of the lower group would have a higher IQ than the average of the higher group. Assume it takes an above average higher group IQ to finish a college education. While half the higher group typically may become college graduates, only a sixth of the lower group can aspire to this status with all it implies about doing well in life. It will be difficult to distinguish this outcome from ethnic or racial discrimination. Considering that Loevinger's sensibilities were jarred by declining IQ ascribed to the aged, what is the likelihood that a lower IQ ethnic group will accept Seligman's reasoning in preference to crying foul?

An alternative is the practice in some universities of admitting students in the

same proportion as that of their ethnic groups in population. These quotas are intended to ensure equal ethnic representation at college graduation. They do of course result in either differential rates of student attrition or in watering down requirements to aid some members of the lower IQ ethnic groups. At the same time, admission quotas do represent active discrimination against high IQ groups.

If Seligman's arguments are correct, differentials in success among ethnic groups in our society are unavoidable, and not necessarily the result of discrimination. This is true at least to the extent to which IQ influences success in life.

Wolf Roder
University of Cincinnati
Cincinnati, Ohio

Lee Loevinger did a fine job reviewing Seligman's "A Question of Intelligence: The IQ Debate in America." There is another important point in Seligman's book, answering the question, "Why are Jews as a group more intelligent than gentiles?" Seligman agrees with Nathaniel Weyl (in the book, *The Creative Elite in America*) The reason is twofold: For generations gifted Jewish boys were encouraged to become rabbis, who had large families. Thus intelligent genes were preserved. In Christendom, on the other hand, for many generations gifted boys were steered into the clergy, where celibacy stopped inheritance of these high IQ genes.

Logical. Perhaps the reduction of high intelligence in Christendom also explains why Japanese and other non-Christians have higher IQs than Europeans/Americans.

D. P. Tracy
Toledo, Ohio

I hesitate to write a criticism of a review of a book I have not read. I am uncertain whether I am criticizing the book or the review. But Loevinger's review of Seligman's *A Question of Intelligence* seems to me to be lacking in the minimum of skepticism necessary for an intelligent discussion of the subject.

Intelligence, as tested, is a social factor. If Seligman is dealing with any intelligence test that is not socially conditioned, I would like to hear about it.

Terence W. Greene
Oakland, Calif.

From the description, it sounds as if Seligman's book on the IQ debate is a good introduction to the debate for the layman. I doubt seriously, however, that it is "a competent and inclusive survey of the best data science has produced to date in the field of mental testing." While the prevailing feeling among many psychologists and psychometricians is that the *g* factor is a legitimate interpretation of the IQ data, it is not by any stretch of the imagination wholly accepted. Psychometricians are experts in the field, but they are biased in certain directions. There are many who doubt that intelligence is a single, simple trait; among this number are Howard Gardner (cf. *Frames of Mind*), CSICOP Fellow Stephen Jay Gould, and others. A recent article in *Psychological Science* (the journal of the American Psychological Society) came out strongly against a *g*-ocentric universe. I remain skeptical that there is a single unified measure of intelligence without more compelling evidence than currently exists. . . .

Furthermore, work in the competency field has suggested that while intelligence tests are useful measures of certain cognitive abilities, they are not the best, nor the most precise, nor even the preferred measures of job competence in many situations, as indeed is noted in the degree of variance accounted for by IQ tests. . . .

Stephen P. Kelner, Jr.
Director of Research
and Development
McBer & Company
Malden, Mass.

Plato's Atlantis was a myth

The basic problem with geoarchaeologist Eberhard Zangger's theory ("Legend Deciphered? Atlantis Was Troy, Says Geoarchaeologist," News & Comment, *SI*, Summer 1993)—or any theory about the location of Atlantis—is that Atlantis was not a real continent or civilization, but a construction of Plato's imagination. Anyone who is familiar with Plato's writings will realize that this story is what he calls in the *Republic* a "noble lie"—a myth meant to instruct and inspire. The *Republic* ends with such a myth, the tale of what a soldier called Er, son of Armenius, a Pamphylian from the southern coast of modern Turkey, saw in the Lower World. Er appeared to have died in battle, but came to life just as he was about to be placed on the funeral pyre, and so he is able to describe what he learned while he was temporarily dead. The ancient audience would have recognized immediately that this tale was Plato's own invention: it is told not by an eyewitness, but at second-hand, and its narrator is a foreigner who spoke another language, long ago, once-upon-a-time. The story of Atlantis has all the same characteristics: it is told at *fourth*-hand, four generations after it was originally told to Solon by an Egyptian, and even then it describes events in the remote and distant past.

No one nowadays believes in the story about Er's visit to the Lower World, despite Plato's vivid description of that mysterious region, because we have other ideas about what happens to the soul after death. Nonetheless, some archaeologists and scientists tend to approach Plato as if he were a historian, and to take him literally at his word, at least so long as his words can be seen to fit the facts that they have themselves assembled about the sites they have excavated and studied. But as each modern Atlantologist has had to admit, no known site resembles Plato's Atlantis in all important respects. Zangger's *Flood from Heaven* is no exception, and for all the elegance of his argument that Atlantis was Troy (*sic*), I doubt if many classical archaeologists will be persuaded by it.

Mary R. Lefkowitz
Andrew W. Mellon Professor
in the Humanities
Wellesley College
Wellesley, Mass.

Scientists on stamps

You invited readers to submit examples of postage stamps that celebrate science or scientists (News & Comment, Summer 1993). I nominate any and all stamps depicting Benjamin Franklin or Thomas Jefferson. Although their contributions as Founding Fathers are universally recognized, we can't forget that they were among the eminent "natural philosophers" of their day and received worldwide acclaim and honors for their work as scientists. I'm enclosing for you the current Jefferson stamp, part of the Great Americans series, which commemorates his 250th birthday.

Michael Minnig
Carmichael, Calif.

I wholeheartedly agree. A good book on Jefferson's contributions to natural philosophy is Thomas Jefferson: Scientist, *by Edwin T. Martin, Collier Books, New York. 1961.—EDITOR*

Gambling on psychic power

The cartoon on page 399 of the Summer 1993 issue, as well as the first paragraph in the "Princeton Experiments" News & Comment article on page 357, prompts these remarks:

It seems obvious that the existence of gambling casinos is upfront evidence against at least certain kinds of psychic claims. I'm sure that thought is not original with me. That a university would fund research having to do with psychically "influencing" or otherwise "knowing" random number generation

seems a waste. Any casino does this kind of experiment 24 hours a day, all year long. Anyone sporting psychic abilities, however mild, should quit wasting time and verbal blather and head straight for Nevada.

Scarne's classic text on gambling contains an amusing description of folks who try to influence the outcome of a roulette wheel by "taking thought." The casinos welcome them, of course.

Norm Pos
San Diego, Calif.

Bad science, bad religion

I read with interest Robert Baker's review of *Scientific Malpractice: The Creation/Evolution Debate*, by Ivan Zabilka (*SI*, Summer 1993), which argues that creationism is not only bad science but also bad religion. I agree with this assessment, and I would like to add a few words from one of the great authorities in Christian theology, St. Augustine of Hippo (354-430).

Augustine wrote on "The Literal Meaning of Genesis" (*De Genesi ad Litteram*), and he poured scorn on those who used the Bible to attack science (Book I, Chapter 19, my translation):

> Suppose that in explaining the words "And God said, 'Let there be light,' and there was light" (Genesis 1:3), one thinks that the light was material, and another that it was spiritual. As to the existence of spiritual light in a spiritual creation, our faith leaves no doubt; as to the creation of a material light, . . . this supposition is not contrary to the faith unless it is shown to be false. And if that should happen, this teaching is not from Scripture but was a teaching proposed by man inignorance. . . .
>
> Often, a non-Christian knows something about the earth, the heavens, and the other parts of the world, about the motions and orbits of the stars and even their size and distances, . . . and this knowledge he holds with certainty from reason and experience. It is thus offensive and disgraceful for an unbeliever to hear a Christian talk nonsense about such things, claiming that what he is saying is based in Scripture. We should do all that we can to avoid such an embarrassing situation, which people see as ignorance in the Christian and laugh to scorn.
>
> The shame is not so much that an ignorant person is laughed at, but rather that people outside the faith believe that we hold such opinions, and thus . . . are rejected as ignorant and unlearned. If they find a Christian mistaken in a subject that they know well and hear him maintaining his foolish opinions based on our teachings, how are they going to believe these teachings in matters concerning the resurrection of the dead, the hope of eternal life, and the kingdom of heaven, when they think that these teachings are filled with fallacies about facts which they have learnt from experience and reason.
>
> Reckless and presumptuous expounders of Scripture bring about much harm when they are caught in their mischievous false opinions by those not bound by our sacred texts. And even more so when they then try to defend their rash and obviously untrue statements by quoting a shower of words from Scripture and even recite from memory passages which they think will support their case "without understanding either what they are saying or the things about which they make assertions." (1 Timothy 1:7)

As you see, arguments about biblical literalism have been around for a long time. I agree with Augustine in his belief that biblical literalists do Christianity a disservice when they spout demonstrably incorrect views, and I am puzzled by one of their assumptions. The basis for biblical inerrancy is simple: If the Word of God is not true, then how are we to be saved? However, the biblical literalists apparently take this one step further: If every word in the Bible is not taken as literally true, then the entire Bible *must* be completely worthless. To me, this does not follow, but I have come across this mindset in any number of fundamentalists I have spoken to.

John A. Hobson
Bolingbrook, Ill.

I would like to correct some inaccuracies in Robert Baker's review of Zabilka's *Scientific Malpractice*. First, Baker states that "None of the 'research' [creationists] do is peer-reviewed or subjected to criticism of any sort." A cursory examination of the *Creation Research Society Quarterly* or the *Ex Nihilo Technical Journal* shows this to be false. At times, the creationists criticize other creationists more strongly and more accurately than their opponents do. (Some examples may be found in Ronald L. Numbers's excellent book, *The Creationists*.) Second, Baker states that "Creationists are predominantly technicians," but neither Baker nor Zabilka give any evidence for this. While this may be true, it is not true of the approximately 600 members of the Creation Research Society, of whom the largest group is composed of biologists. (Of the ten who founded the CRS in 1963, five had biology Ph.D.s, one had a biochemistry Ph.D., and one had a master's degree in biology.) If any discipline is underrepresented among creationists, it is not biology but geology, as Numbers points out.

Baker concludes by assessing Zabilka's book as clear, concise, and thorough. While I agree that it is clear and concise, it is not thorough. It is fairly good in its treatment of the political and legal history of creationism (although weak in its intellectual history, where Numbers's book excels), and in its discussion of theological issues. But its coverage of the scientific claims of creationism is incredibly weak—only a single chapter of 22 pages is devoted to a superficial coverage of the scientific evidence that refutes the creationists' claims. I recommend the other books Baker mentions, but would add that the most thorough examination of creationism to date is still Arthur N. Strahler's *Science and Earth History* (Prometheus Books, 1987), a massive 558-page book that addresses the vast majority of creationist arguments.

Jim Lippard
Tucson, Ariz.

The blue sense

In his reply to my critial letter (*SI*, Summer 1993), Mark W. Durm: (1) claims that the sources we cite for a "serious scientific case" for psi are not such; (2) states that I wrote "ambiguously" in my letter that the blue sense does not necessarily refer to psi; (3) insists that their survey's questions #4 and #5 are not biased; (4) wonders what basis exists for my assertion that most previous evidence indicates greater rural than urban police use of psychics; and (5) claims I misinterpret as positive his finding that 35 percent of the departments he surveyed used psychics since most of the specific comments from these departments were disclaimers. Let me respond to each point.

1. Though Durm writes that our "quoting of [unspecified] anomaly research, Louis [*sic*] Rhine's research, and the *Census of Hallucinations* is not quoting 'serious' science," his unsupported assertion is insulting to those researchers. Whatever Durm may think of their arguments and evidence, these are certainly serious science efforts and have been treated as such by such critics as Ray Hyman. In any case, Chapter 3 of our book deals with a great many other examples of research, including laboratory studies (like the ganzfeld work), which CSICOP has treated seriously in the past. Durm apparently ignores these.

2. Durm quite illogically tries to show my letter's supposed ambiguity by quoting a passage from our book which refers to what may be psychic powers as an example of the blue sense. This does not contradict my assertion that the blue sense "does not necessarily refer to a psychic ability at all" since it includes nonpsychic as well as what might be psi abilities. As most reviewers have noted, we clearly take an agnostic-skeptical (though not dismissive) view that the blue sense may or may not actually involve psi abilities.

3. The bias in Sweat and Durm's questions remains plain. The serious science question is not whether psychic information is "more helpful" than

ordinary information. A normal source, such as an eyewitness, produces more useful information for police use than that from an alleged clairvoyant's report. Who has claimed otherwise? I know of no psychics who think they should replace conventional police work. The real question is whether information from a psychic is better than *no* information from normal channels. Police typically use psychics when they are at a dead end and have exhausted normal means for information.

4. The evidence that psychics are typically used by rural departments is evident from (*a*) the many cases cited in our book and most other books dealing with psychic sleuths, (*b*) even a cursory look at newspaper and tabloid stories reporting the use of psychics by police, and (*c*) the fact that urban departments normally involve bureaucracies that make formal approval for such unconventional methods difficult.

5. The title of the Sweat and Durm article asks the question "Psychics: Do Police Departments Really Use them?" The authors reply in the negative, concluding that "there is *not* a prevalent use of psychics." The question they posed was *not* whether police *successfully* use psychics. I think most reasonable readers would find a 35-percent rate to be "prevalent use." They might also agree with us that even a low "hit" rate, especially in dead-end cases where there is much community pressure for a solution, may justify trying a previously successful or police-recommended psychic.

Marcello Truzzi
Professor of Sociology
Eastern Michigan University
Ypsilanti, Mich.

Congratulations

Another thematic cycle reaches an end, and I am sure that part of its success is due to the activity of the SKEPTICAL INQUIRER. Walking on fire has been the subject of at least two demystifying articles in the past issues of your journal. Clear explanation of the physical principles involved in this phenomenon has helped to eradicate more complex (less parsimonious and unsubstantiated) "mind-forces"-based explanations. And the sweet end arrives when this "strange" phenomenon becomes available to most simple humans. The July 19, 1993, issue of *Newsweek* lists "walking on fire" among "exciting activities" for summer like rock climbing, sky diving, etc.

Congratulations for very needed and well done work.

Antonio Garcia-Valdecasas
Museo Nacional de Ciencias Naturales
Madrid, Spain

Experiment guides quantum mechanics

Gary McGath has accused me of harboring a pseudoscientific belief (*SI*, Letters, Summer 1993).

Perhaps our argument about quantum mechanics and realism is merely semantic—I am using "realism" in the same sense as did Einstein, Rosen, and Podolsky in the original EPR paradox paper: "If, without in any way disturbing a system, we can predict with certainty . . . the value of a physical quantity, then there exists an element of physical reality corresponding to this physical system." What Bell—and more recently Greenberger, Zeilinger, and Horne—have taught us is that this statement is not true in any meaningful sense if quantum mechanics is correct. Since I *am* a physicist, I am forced to face these odd properties of quantum mechanics on a daily basis in a concrete fashion. McGath's letter is typical of the fuzzy thinking of armchair philosophers who muse about physics but have no way to quantify their thoughts. His proposed test for the principle of realism—where two observers measure precisely the same event—illustrates McGath's ignorance of the basic postulates of quantum mechanics. Due to the projection postulate and the collapse of the wave

function, it is impossible for two observers to measure the same event—the measurement by one excludes the other. This is the whole point, and McGath has missed it.

I am reminded of a story in Richard Feynman's *Surely You're Joking, Mr. Feynman.* Feynman attends a philosophy seminar where he is asked to define the "essential essence" of an electron. Confused, Feynman asks them to define for him the essential essence of a brick. Each philosopher gives an entirely different answer. Ask a roomful of physicists to give the mass of an electron and you'll get uniform agreement. Certainly philosophy has its place in science—but to turn to philosophers rather than experiment for the guiding principles of physical law? You'll forgive me if I'm a little skeptical.

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National Research Council
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Electronic SKEPTIC

It might be of interest to your readers to know about SKEPTIC, an electronic discussion group on the issues the SKEPTICAL INQUIRER is concerned with. It is on the Internet, and thus can potentially reach a larger audience than similar groups on Usenet or local BBS's.

A number of participants, such as Robert Sheaffer, Vic Stenger, and Brian Siano, are already familiar to skeptics. We also have a number of defenders of anomaly claims. The level of discussion includes both informal exchanges and fairly serious examinations of topics of skeptical concern.

The discussion of pseudoscience on SKEPTIC naturally involves much science, and philosophical considerations. The common point of view is skeptical toward the paranormal, but critical approaches to science itself are also encouraged. My hope is that more skeptics will take advantage of the opportunities provided by electronic-communications technology.

If anyone wants to join our virtual skeptic community (which has the advantage of being participatory), they can either do so directly by sending the e-mail message "subscribe skeptic first-name last-name" to the address "list-serv@jhuvm.hcf.jhu.edu," or request more information from "skeptic-request@jhuvm.hcf.jhu.edu." An annotated skeptics bibliography file is also available to the public. There are about 250 subscribers at the moment, and we seek to expand our reach.

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World's birthday?

Our member, Phil Spencer, a self-confessed knucker maker, who practices his arcane craft on the bank of the Motueka River, near Nelson, New Zealand, draws our attention to a forthcoming anniversary of great importance. Forget, says Phil, such arbitrary artificialities as the year 2000 (or 2001). Remember, rather, Bishop Usher's calculation that the world was created on November 25, 4004 B.C.

We therefore call upon skeptics everywhere to prepare themselves for 1997, when we all celebrate the six-thousandth birthday of Old Mother Earth.

Bernard Howard
New Zealand Skeptics
Christchurch, N.Z.

The letters column is a forum for views on matters raised in previous issues. Brief letters (less than 250 words) are welcome. We reserve the right to edit longer ones. They should be typed double-spaced. Due to the volume of letters, not all can be published. Address them to Letters to the Editor, SKEPTICAL INQUIRER, 3025 Palo Alto Dr. NE, Albuquerque, NM 87111.

Local, Regional, and National Skeptics Organizations

The organizations listed below have aims similar to those of CSICOP but are independent and autonomous. They are not affiliated with CSICOP, and representatives of these organizations cannot speak on behalf of CSICOP.

UNITED STATES

ALABAMA. Alabama Skeptics, Emory Kimbrough, 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 (205-759-2624).

ARIZONA. Tucson Skeptical Society (TUSKS), James McGaha, Chairman, 5655 E. River Rd., Suite #101-127, Tucson, AZ 85715. **Phoenix Skeptics,** Michael Stackpole, Chairman, P.O. Box 60333, Phoenix, AZ 85082.

CALIFORNIA. Bay Area Skeptics, Wilma Russell, Secretary, 17723 Buti Park Court, Castro Valley, CA 94546. **East Bay Skeptics Society,** Daniel Sabsay, President, P.O. Box 20989, Oakland, CA 94620 (510-420-0702). **Sacramento Skeptics Society,** Terry Sandbek, 3838 Watt Ave., Suite C303, Sacramento, CA 95821-2664 (916-488-3772).

COLORADO and WYOMING. Rocky Mountain Skeptics, Béla Scheiber, President, P.O. Box 7277, Boulder, CO 80306.

CONNECTICUT. (See New York Area Skeptics, New York.)

DISTRICT OF COLUMBIA, DELAWARE, MARYLAND, and VIRGINIA. National Capital Area Skeptics, c/o D. W. "Chip" Denman, 8006 Valley Street, Silver Spring, MD 20910.

FLORIDA. Tampa Bay Skeptics, Gary Posner, 1113 Normandy Trace Rd., Tampa, FL 33602 (813-221-3533).

GEORGIA. Georgia Skeptics, Becky Long, President, 2277 Winding Woods Dr., Tucker, GA 30084.

ILLINOIS. Midwest Committee for Rational Inquiry, Danielle Kafka, President, P.O. Box 2792, Des Plaines, IL 60017-2792. **Rational Examination Assoc. of Lincoln Land** (REALL), David Bloomberg, Chairman, P.O. Box 20302, Springfield IL 62708 (217-787-9098).

INDIANA. Indiana Skeptics, Robert Craig, Chairperson, 5401 Hedgerow Drive, Indianapolis, IN 46226.

KENTUCKY. Kentucky Assn. of Science Educators and Skeptics (KASES), Chairman, Prof. Robert A. Baker, 3495 Castleton Way North, Lexington, KY 40502.

LOUISIANA. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM), c/o Wayne R. Coskrey, P.O. Box 82060, Baton Rouge, LA 70884-2060.

MASSACHUSETTS. Skeptical Inquirers of New England. Contact Laurence Moss, Ho & Moss, 72 Kneeland St., Boston 02111.

MICHIGAN. Great Lakes Skeptics, Carol Lynn, contact, 1264 Bedford Rd., Grosse Pointe Park, MI 84230-1116.

MINNESOTA. Minnesota Skeptics, Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416. **St. Kloud ESP Teaching Investigation Committee** (SKEPTIC), Jerry Mertens, Coordinator, Psychology Dept., St. Cloud State Univ., St. Cloud, MN 56301.

MISSOURI. Kansas City Committee for Skeptical Inquiry, Verle Muhrer, Chairman, 2658 East 7th, Kansas City, MO 64124. **Gateway Skeptics,** Chairperson, Steve Best, 6943 Amherst Ave., University City, MO 63130.

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NEW MEXICO. New Mexicans for Science & Reason, John Geohegan, Chairman, 450 Montclaire SE, Albuquerque, NM 87108; John Smallwood, 320 Artist Road, Santa Fe, NM 87501 (505-988-2800).

NEW YORK. New York Area Skeptics (NYASk), Wayne Tytell, contact person, 159 Melrose Ave., E. Massapequa, NY 11758, (516) 798-6902. **Western New York Skeptics,** Tim Madigan, Chairman, 3965 Rensch Rd., Buffalo, NY 14228.

OHIO. South Shore Skeptics, Page Stephens, 6006 Fir Avenue, Cleveland, OH 44102 (216-631-5987). **Association for Rational Thinking** (Cincinnati area), Joseph F. Gastright, Contact, 111 Wallace Ave., Covington, KY 41014, (513) 369-4872 or (606) 581-7315.

PENNSYLVANIA. Paranormal Investigating Committee of Pittsburgh (PICP), Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh, PA 15217 (412-521-2334).

TEXAS. Houston Association for Scientific Thinking (HAST), Darrell Kachilla, P.O. Box 541314, Houston, TX 77254. **North Texas Skeptics,** Joe Voelkering, President, P.O. Box 111794, Carrollton, TX 75011-1794. **West Texas Society to Advance Rational Thought,** Co-Chairmen: George Robertson, 4700 Polo Pky., Apt. 183, Midland, TX 79705-1542.

WASHINGTON. The Society for Sensible Explanations, P.O. Box 7121, Seattle, WA 98133.

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(continued on next page)

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The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and disseminates factual information about the results of such inquiries to the scientific community and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues. To carry out these objectives the Committee:

- Maintains a network of people interested in critically examining paranormal, fringe-science, and other claims, and in contributing to consumer education
- Prepares bibliographies of published materials that carefully examine such claims
- Encourages research by objective and impartial inquiry in areas where it is needed
- Convenes conferences and meetings
- Publishes articles that examine claims of the paranormal
- Does not reject claims on a priori grounds, antecedent to inquiry, but examines them objectively and carefully

The Committee is a nonprofit scientific and educational organization. The SKEPTICAL INQUIRER is its official journal.